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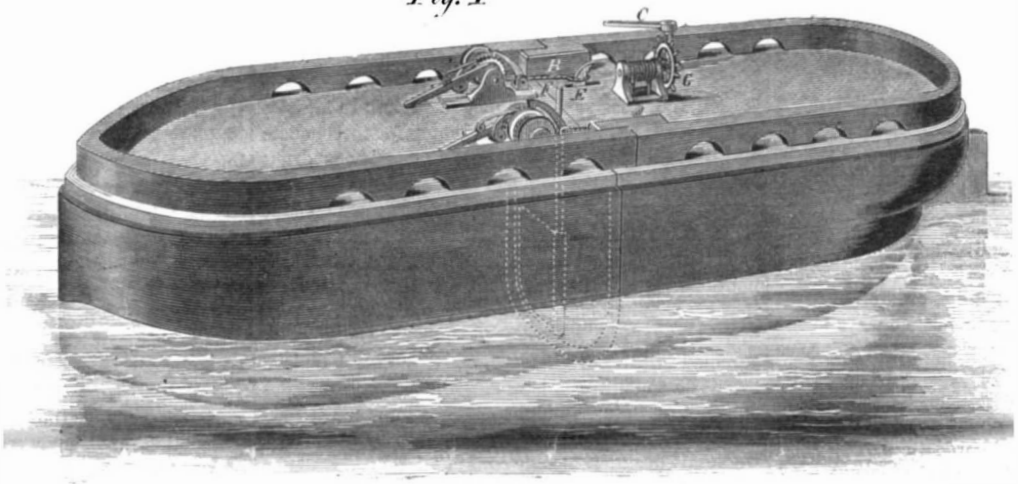
Improved Canal Boat.

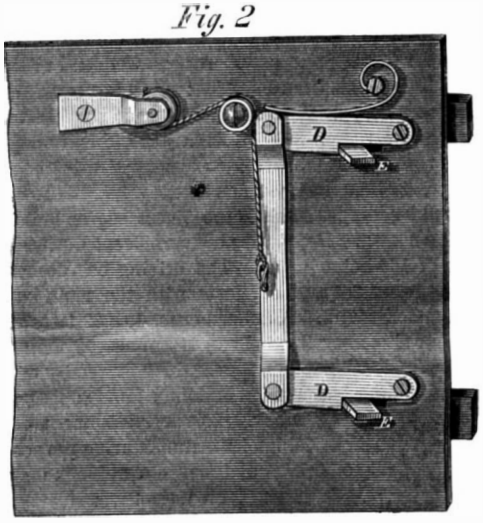
It is claimed by the inventor of the machinery used on this canal boat, that it is an improvement upon those now in use, that it is readily controlled and, when properly cared for, at all times efficient. The canal boat is of that desirable class which is built in sections and connected by bolts or their equivalent. The invertor claims as novel the extension of the deck rails, A, so that they bear on the deck of the stern section, and attaching a piece of timber, B, just inside the other rails so that it bears on the deck of the forward section; these parts, together with the windlass, forming a secure and rigid connection for all practical purposes in smooth water, when the bow and stern are trimmed a trifle deeper than the midship ends.

Fig. 1



The two parts are disconnected by the lever, C. When this is shipped in one direction the arms, D (see Fig. 2), below the deck, are drawn away from the hooks, E, thus allowing them to move forward in the slot, seen in Fig. 1, and ease off the line or chain, F, so that it can be cast off. The windlasses are to take up the slack and heave the two sections together when they are loaded. It is intended to steer the boat from the wheel, G, so the wheelman can be at hand to disconnect the sections when necessary. The midship rudder, seen in dotted lines, is protected by an extension rail built around the margin of the end section, thus forming a compartment in which

Fig. 2



the rudder remains when the two sections are attached.

This invention was patented through the Scientific American Patent Agency on the 21st of Nov., 1864, by E. Heath of Rochester, N. Y., whom address for further information,

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MANSFIED mountain, in Vermont, has been lately re-measured, and the "chin" found to be four thousand three hundred and eighty-nine feet above tide-water.

Another New English Steam Engine.

At the Dacca Mills, in this city, there has been exhibited this week a model, consisting of two small steam engines working in one frame-work, and coupled into one crank-shaft—an arrangement which is certainly ingenious and novel. Whether it will prove practicable and profitable remains to be determined when the inventors shall have been able to embody their ideas in a 20 horse-power double engine, which will occupy a space of about six feet square, and which it is desirable, for the sake of engineering science, should be done at an early date. The engines exhibited supplied power to turn the shafting and machinery in some rooms adjoining, and, as a working model, they gave fair promise of producing satisfactory results. The inventors state that the object is to make all the steam admitted into the cylinder available as motive power, to dispense with resistance at the cylinder ends, and to secure increased facility for expansion, thereby gaining considerable advantage over the ordinary steam-engines. The manner of performing this is as follows:—They employ two pistons, each of a segmental form, working in a horizontal cylinder. These pistons are on two shafts joining each other end to end, or the one passing through the other; and instead of the pistons moving in a straight line as usual, the steam is admitted between the two segmental pistons, causing them to recede from and approach each other in the arc of a circle in the cylinder, the shafts being the center. The pistons are kept steam-tight by suitable packings, and the slide-valves are constructed and worked in the usual manner. This arrangement is applicable to stationary, marine, locomotive, high-pressure, condensing, and compound engines. It is claimed that the expansive force of the steam acts equally on the two pistons, and forces them apart with the power due to the area of the pistons and the pressure of the steam, and that the force thus exerted on both the pistons is united and conveyed to the crank-shaft; whereas, in steam-engines of the usual construction, with a piston working in a cylinder, they state that half the force exerted is always acting on one of the ends of the cylinder. When it is remembered that within a very recent period Watt's standard for working a steam-engine was followed at about 7 lbs. pressure of steam and a velocity of 240 feet of the piston per minute, instead of as at present working steam expansively at ten times that pressure, and 260 feet velocity of the piston, every novelty like this under notice is worth careful attention and fair consideration, to ascertain if still further progress may be made in engineering science.—*Manchester Guardian.*

HEATH'S CANAL BOAT.

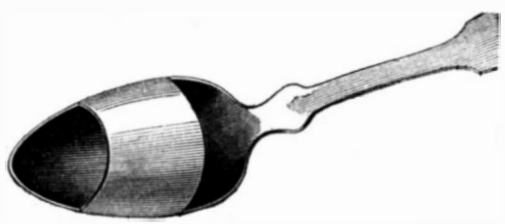
California Fruits.

Figs and olives were introduced into California at the Missions over sixty years ago, and have taken to the soil admirably, very seldom failing to give abundant crops whenever they were planted in proper climates and soils. Some of the olive trees near Santa Barbara and San Buenaventura, are sixty years old and are still thrifty. The fig, however, has to be more carefully attended to. Dried figs of an excellent quality, from the black variety, are dried every season in the south. The olives of San Fernando, San Gabriel and San Diego, when pickled, are said to surpass in flavor and size, during some years, even those of Seville, and the oil is fully equal, when properly prepared, to that of Florence. The olive tree does not bear an abundant crop except every two or three years; and this year the fruit in the old missions of the south is a very scanty crop, although large in size. In 1863 the trees yielded immensely and considerable quantities of oil were made, which sold well. The crops of figs have been very abundant in many places this year, but the quality is generally much inferior to that of former seasons.

The prickly pear has been very abundant in 1864; and from its extensive dispersion near the far southern Mission, has been largely made use of in the absence of the usual fruits. Its nutritious and saccharine qualities deserve to be better known at the north than they are.

MOUSTACHE SPOON.

A moustache is an ornament to the human face divine, under ordinary circumstances, but when it is drenched in a cup of smoking coffee or emerges dripping from the cream, as Venus rose from the sea, the



wearer of it is placed in an embarrassing position. Moustache coffee cups have been sold in stores for many years. These cups have a portion of the top covered with a bridge in which there is an opening whence the beverage finds its way down the throat of the drinker without soiling his hirsute appendage.

This mysterious-looking spoon effects the same object. When soup is taken, unless the eater thereof is dexterous, and "understands his business," he is apt to present an uninviting spectacle, and becomes a very undesirable addition to a small but select dinner party. Hence this spoon. The bridge over the

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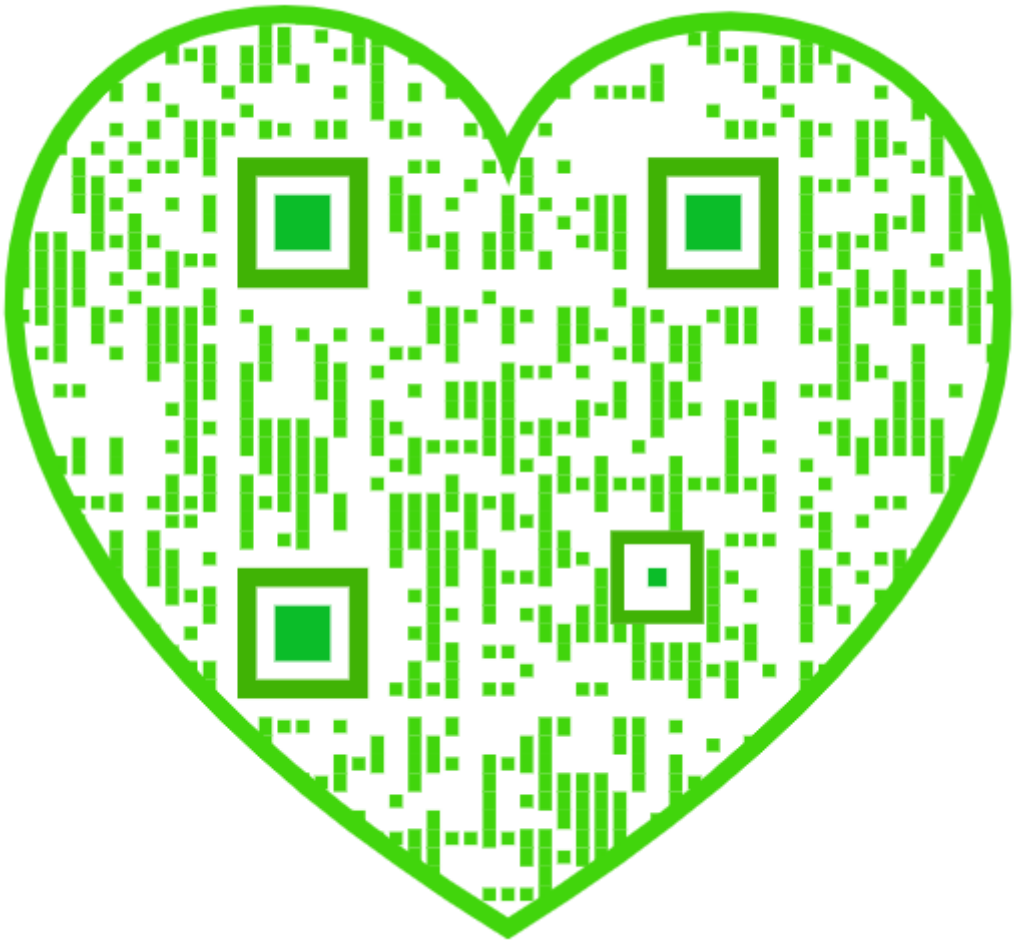

center prevents the disagreeable results alluded to, and supports the moustache in its passage over the savory flood. The bridge may be made permanent or removable, and can be attached in a few minutes and by any common mechanical device.

A patent is now pending on this spoon through the Scientific American Patent Agency, by Messrs. M. B. and N. A. Patterson, of Kingston, Tenn., whom address for further information.

African Fruits.

Of African edible fruits and seeds, one could almost go on to infinity, for there are few indigenous that are not eaten by the natives, in some form or another. The Blood Plum of Sierra Leone (*Hæmatostaphis Barteri*), has a pleasant sub-acid flavor when ripe; in size and form it is similar to a grape, but somewhat larger. Another fruit of the same shape and form, but smaller, and with less pulp, is considered a favorite fruit on the Niger; it is a species of Vitex. The fruit of Sarcocephalus esculentus, called in Sierra Leone Native Peach, is, when full grown, about the size of a large apple; it is of a pulpy nature; the outside is rough and uneven, and bears some resemblance to a Custard Apple (*Anona*). The pulp of the Baobab (*Adamsonia digitata*), has a very pleasant and agreeable sub-acid flavor, and is much esteemed by the natives in making a kind of sherbet or cooling drink. Detarium senegalense, called Duttock on the Gambia, where it grows to an immense tree, produces a fruit, the pulp of which is eaten, as well as the kernel or seed. In size and shape it is like a large Chestnut; the outer skin is of a dark dull brown. The small pod of the Codarium acutifolium is remarkable for its velvet appearance; hence it is sometimes called Velvet Tamarind, and is also known as Black Tamarinds. The pulp enveloping the seed has quite the flavor of East Indian Tamarinds, and is valued by the natives of Sierre Leone on that account. The Ochro (*Abelmoschus esculentus*), is common on the Niger, and is used on account of its mucilaginous properties in various ways in the preparation of native dishes. The seeds of a species of Triculia are also eaten in this part of Africa; the fruit is very similar to the Bread-fruit to which it is closely allied. Its size is about that of a child's head; the seeds are small and hard; the native name is Akna. The fruits of Habzelia æthiopica are used as pepper, and are sold in the markets at Nupe as well as at Bahia. The seeds of Monodoro grandi flora, tenufolia, and brevipes, are all more or less aromatic, and would seem to be well adapted, if shipped in any quantity, for a useful condiment in this country. Many of the Anonaceæ have the same decided fragrance, but none so powerful as in this genus. The fruits are very large and round; those of M. grandiflora quite the size of a large cannon ball, the other species somewhat smaller. The seeds are about the size of a common Scarlet Runner Bean, and are very thickly embedded in the pulp, which fills up the interior of the fruit. The fruits of the Wild Mango, probably a species of Spondias, are eaten on the Niger, and on the Zambesi the kernels of a species of Sclerocarya. The stones of this fruit, however, are very hard and difficult to crack; these kernels appear to contain a quantity of oil, and perhaps might be turned to account in that way. The fruit of Malpighia saccharina, called in Sierra Leone the Sugar Plum, in shape and size resembles the Damson. It has a sweet and agreeable flavor, and is in perfection in the months of February and March, when it is to be seen in large quantities in the market of Freetown. The tree producing it is lofty and majestic in appearance, attaining a hight of 80 feet. The large seeds of Pentaclethra macrophylla, known in the Eboe country as Opachalo, and in Gaboon as Owala, are collected at the seasons of their falling, and eaten as food; they also yield a clear limpid oil. The young germinating shoots of Borassus æthiopum are eaten by the natives both of East and West Africa; for this purpose they are taken up soon after the seed has vegetated, and are then boiled in a similar manner as we cook cabbages or some such vegetable. The large seeds of Cycas circinalis, from which the natives of Ceylon and Western India prepare a kind of Sago, are valued as an article of food in some parts of the Zambesi. The existence of a species of Cycas was discovered in Western Africa by the botanist of the Second Niger Expedition, as well as by Gustav Mann, both of whom found that that the natives used the seeds as an article of food. Of the Dika or Udika bread, a specimen of which arrived in this country some three or four years since, and was then supposed to be procured from the seeds of the Mangifera gaboniensis, it will be sufficient to say that upon further researches it is proved to be derived from no Mango, but from the seeds of Irvingia Barteri. The fruit is similar in form and size to that of the Mango, but the seeds, which contain a large amount of oil, are separated from the fruits and beaten in a trough till they attain a partially fluid state. This is then put into baskets of Musa leaves, and exposed to the sun, when a white tallow collects on the surface, which is poured off, and the Dika allowed to cool in the shade. The natives esteem it very highly in the various preparations of their food, but more especially in cooking fish. It has, however, a strong, rank, and highly disagreeable taste. The fruit of a species of Parinarium, known on the Zambesi as Mobola, is valued on account of the very sweet pulp which surrounds the seeds. The Gero corn (*Penicillaria spicata*), is in common use for household purposes on the Niger and Gambia. The seeds of Sorghum vulgare are also extensively used for preparing as malt.—*Technologist.*

Enormous Consumption of Laudanum in England.

Dr. Alfred Taylor, commissioned by the Privy Council, has sent in a Report on the means of committing murder by poison which are allowed to exist in England. He says that poison enough to kill two adults can be purchased anywhere for threepence; and that the careless dispensing of poisonous drugs is the cause of most frightful accidents. As to laudanum, it appears to be sold wholesale, single shops often supplying three or four hundred customers every Saturday night. Retail druggists often dispense 200 lbs. in one year, and one man complained that his wife had consumed £100 in opium since he married. It is a mistake to consider the practice confined to the marshy districts. We do not believe there is a town in England where some one chemist does not on Saturday night load his counter with little bottles of laudanum; and we are assured by a wholesale druggist that he could and did sell it in the eastern counties to the extent of some thousands of pounds weight in a year. This gentleman, an old and keen observer, declared that the demand had sprung up shortly after the introduction of teetotalism, and that it would be found to vary everywhere, in accordance with the progress or decline of the system of total abstinence.—*Spectator.*

What Protects the Stomach against its own Secretions.

This question was discussed some time ago by Dr. Pavy before the Royal Society. He stated that the "living principle," suggested by John Hunter as the protecting agency, did not stand the test of experiment, for it had been shown that the tissues of living animals might be dissolved by the stomach secretion; the prevailing notion, he observed, that the mucous lining of the organ served as its source of protection, by its susceptibility of constant renewal during life, was equally untenable, for he had found by experiment that a patch of entire mucous membrane might be removed, and food would be afterwards digested in the stomach, without the stomach itself presenting the slightest sign of attack. The view propounded by Dr. Pavy was one dependent on chemical principles. The existence of acidity was an absolutely essential condition for the accomplishment of the act of digestion.

Now, the walls of the stomach being permeated so freely as they are during life by a current of alkaline blood, would render it impossible that their digestive solution could occur. After death, however, the blood being stagnant, there would not be the resistance to the penetration of the digestive menstruum, with the retention of its acid properties, that existed during the occurrence of a circulation, and thus the stomach became attacked, when death took place during the digestive process, notwithstanding it had previously been maintained in so perfect a state of security. Dr. Pavy, in advocating this view, brought forward experiments which showed that digestion of the stomach might be made to take place during life whenever the circumstances were such that an acid liquid in the stomach could retain its acid properties whilst tending to permeate the walls of the organ, gastric solution was observed. The question of result resolved itself into degree of power between acidity within the stomach and alkalinity around. It did not appear that the digestion of living frogs' legs and the extremity of a living rabbit's ear, introduced through a fistulous opening into the stomach, offered any valid objection to his view. A portion of living stomach was surrounded by a ligature, digestion was suffered to go on, and it was found that the ligature portion was digested, the remainder of the organ escaping.

In the case of the frog's legs, it might be fairly taken that the amount of blood possessed by the animal would be inadequate to furnish the required means of resistance. In the case of the rabbit's ear, the vascularity of it being so much less than that of the walls of the stomach, there was nothing unreasonable in conceiving that whilst the one received the other might fail to receive protection from the circulating current, on account of the disparity of power that must belong to the two.

Manufacturing Improvements in Providence, R. I.

The Corliss Steam Engine Co. have, during the past year, more than doubled the capacity of their works. The following buildings have been erected:—A boiler shop, 100×150 feet, 30 feet high; a ware-room where castings are first received, 80×140 feet; an iron foundery, 132×237 feet, and a smaller building, 28×40 feet, for brass castings. The foundery building formerly used has been altered into an erecting shop, where the engines are put together and prepared for shipment. This building is 111×131 feet.

This establishment is now doing the heaviest class of work that is done in this country, or, in fact, in the world. In a casual look at the work being done at present, we noticed a mold for a 100-inch cylinder, for the sloop-of-war *Pompanoosuc*, now building at the Charlestown Navy Yard. Two of these cylinders are to be cast, and will require 32 tuns of iron each. The various parts of the engine for the above vessel were lying about the works, in different stages of completion, and they were truly of magnificent proportions. We noticed two 80-inch cylinders, also for Government work, already cast.

The Providence Tool Co.'s works have undergone a most remarkable change since January 1. At that time the old works stood as originally built. Since that time a second story and high attic have been built upon the main building for 210 feet of its length, and a fine tower four stories high adjoining the main building, at the center of the front. This tower contains a fine-toned bell of 1,000-pounds weight, cast by Frederick Fuller, of Providence. A wing, 70×145 feet, one story, running westerly, has been added to the northern extremity of the main building. It is used for forging purposes. A new wooden building, 30×50 feet, has been built just south of the center of the forge shops. It is used for various purposes. A tempering room, 25×15 feet, joins this building. This room has a fine western light. A brick engine house, 35×40 feet, stands next south of the last-named buildings. This is the finest engine building we have seen. It contains a magnificent Corliss engine of 160-horse power. The driving belt descends to the basement and connects with the main building, underground. A boiler house, 40×32 feet, containing four large fine boilers, is connected with the engine house. Back of the southern extremity of the main building is a wooden building, 110×30 feet, one story, for drying stock. This establishment comprises fourteen buildings for manufacturing purposes, mostly built of brick, and seven dwellings for the employees. It is situated on West River street. All kinds of heavy hardware and ship-iron works are manufactured. The outlay has been upwards of $100,000.

THE excavations at Pompeii have just led to the discovery of a temple of Juno, on the flags of which were scattered about more than 200 skeletons. They are those of women and children who, during the eruption of Vesuvius, had hastened to the temple to seek refuge and implore the protection of the goddess.

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IRON MINIUM.

Iron minium, a coloring matter founded on the iron principle, is destined to supplant red lead and other pigments that have been used until now for coating wood, iron and other metals. The advantages of iron minium are; its solidity, durability, cheapness, and above all, its property of preserving the iron completely from oxydation, and of hardening the wood. These qualities, now acknowledged by first-rate manufacturers, have assured the fullest success to the iron minium, which is advantageously employed all over Europe in the largest manufactories and sugar-works, as well as by the railway and steam navigation companies.

The great solidity of this new paint is principally due to its extreme purity. It contains no acid, no adulteration, and is therefore superior to lead minium, which contains always some sulphuric acid, a small quantity, it is true, but quite enough to attack the iron and to eat into it, after a very short space of time.

Iron minium forms a very smooth and stripeless coat upon the iron, varnishing, as it were, the metal, and preventing the atmospheric influences from having any action upon the paint.

It results, from statements made by eminent English and French chemists and engineers, that the use of red-lead and generally of all preparations in which lead is employed, is injurious to the iron coated with it. They examined vessels in which the iron, after one single voyage to the East Indies, was visibly corroded, and blisters discovered on the coating itself, containing a clear liquid, and exposing thus the iron, which presented a certain number of metallic crystals. Each blister was found to be a sort of galvanic battery, and corrosion in such a case is unavoidable, because there is always a chemical action going on, whenever electricity is produced. This phenomenon must needs continue as long as there remains any red-lead, in consequence of the immediate contact of the lead paint with the metallic surface. Red-lead, therefore, as well as any other lead pigment, ought to be completely excluded from the paint of iron vessels. The best result, therefore, has been obtained by coating with iron minium the exterior and the interior of iron vessels.

Iron minium has been tried by first-rate manufacturers, and always to their greatest satisfaction; it is employed in the most important building yards, for sugar-works, for railways and steam navigation, for the prisons of Belgium and other countries, it has been adopted by the great public services, civil and military, in almost all the countries of Europe.

Iron minium is also preferred for the under-coat of all the running railway material, the painting inside and outside of the wagons, as well as for the under and upper part of carriages. Locomotives, tenders, and iron and wooden bridges are all, with great advantage, coated by this minium. It also covers usefully all kinds of tarpaulins.

The iron minium is employed the same as all other paints, with boiled or unboiled linseed oil; if the oil is not boiled, some dryers must be added, for instance litharge or any good siccative, but not turpentine. For iron vessels or any works exposed to the contact of salt water, it is necessary to take boiled flax oil, and not to employ litharge, but a good siccative, and not to expose the object to the action of the water before the painting is perfectly dry.

Iron minium mixes easily with other colors, such as black, yellow, green, etc.; and by so doing a variety of colors is obtained, to the convenience of persons who would not like the dark brown of the iron minium paint. It has been proved by experiments that the iron minium paint lasts twice and even three times as long as red-lead paint.

Iron minium has also been employed for the painting of sugar vats, standers of iron plate or cast-iron boilers, and all kinds of steam engines; it resists generally the strongest heat. Mixed with mineral tar, it forms an excellent coat for wooden vessels, since it hardens the wood to a remarkable degree. It is most advantageous for gas tubes.

It is another important advantage of this paint, that mixed with oil there is no apparent alteration, whilst red-lead, when it remains a few days not used, shows some clots not to be reduced, and brought forward by the influence of the oil on the oxide of lead. The iron minium paint is to be applied in several layers, the first ought to be thin, the second a little thicker. The proportions of the mixtures are as follows:—One pound of iron minium to be ground with one and a half per cent of boiled or unboiled flax oil, to be added one-twentieth per cent of dryer.—*London Practical Mechanic's Journal.*

How English Working-people Live.

Nothing can be more surprising to the American people than the extreme indigency and physical degeneracy of the British working-people. Mr. Kay's work on the "Social Condition and Education of the People in England," published last year in England, and reprinted in this country, made some remarkable disclosures, bearing especially upon the moral condition of these people. At the close of his work Mr. Kay says:—"The poor of England are more depressed, more pauperized, more numerous in comparison to the other classes, more irreligious, and very much worse educated than the poor of any other European nation, solely excepting Russia, Turkey, South Italy, Portugal and Spain."

The medical officer of the Privy Council in England is required to submit annually a report of the proceedings of that body, This duty has devolved upon Mr. John Simon, whose series of reports for the last four years is a harmonized body of practical information on the causes and distribution of disease. His last report, for 1864, is full of interesting and important truth respecting the amount and kind of food taken by the working-classes. As Mr. Kay's book related to the causes leading to moral degeneracy, this report is concerned chiefly with those which conduce to physical deterioration.

For the purposes of investigation inquiry was made in only a few households which seemed to be fair samples of their class. The inquirer set out with this theory; namely, that to prevent starvation or the diseases connected with it, a woman must have in her food, daily, 3,900 grains of carbon and 180 of nitrogen, or as much nourishment as is contained in a half quartern loaf of bread. A man wants one-ninth more.

Forty-two families of silk weavers were examined, and it was found that these did not quite come up to this *minimum* standard; thirty-one families of needlewomen fell far very 'short; of farm-laborers' families more than one-third were below the mark. Of course this sacrifice of appetite would be made after every other sort of sacrifice had been made, after necessary clothing and fuel had been dispensed with.

It was found among silk-weavers and twisters that, while over twelve pounds of bread were necessary to each adult, little more than nine were eaten. By buying food in pennyworths a great deal of money was wasted. The children working away from home, instead of taking with them dinner prepared by the mother, are supplied with three half-pence or two-pence a day dinner money, which they spend at a cook-shop—usually a penny upon pudding and a half-penny upon potatoes. When they spend two-pence they are permitted to sit down and have a little gravy or fat added to their meal.

Of all classes the needle-women fare the worst. They take to their calling when every other resource fails, and their average income is below four shillings (less than one dollar) per week; sometimes, too, they are out of employment. They use a little over an ounce of tea per day, into which they rarely put milk. Of meat some buy two ounces daily; others a quarter of a pound of cooked meat three times a week, and twice that amount on Sunday.

Glove-stitchers, in order to earn five shillings and sixpence a week, are compelled to work from six in the morning until eleven at night; and even children between nine and fourteen years of age are kept all day at this employment.

As a general result of the inquiry among all these classes, it appeared that of bread the needle-women ate least, the shoemakers most; that of the persons interrogated in all classes, only four—three of them being kid-glovers—went wholly without sugar, the kid-glovers generally using least sugar, the needle-women and stocking-makers most; the balance of carbon in the diet being re-adjusted in these cases by an exactly reverse proportion in the use of butter. Only in five of the whole number of cases was there no meat at all eaten, and the five were all found among the silk-weavers of Macclesfield and Coventry. But twenty in every hundred ate butchers' meat in no appreciable quantity, preferring to use bacon. Beer of the ordinary strength was found to be drunk very generally by the silk-weavers of London, and by the shoemakers, and a very weak beer by the stocking-makers of parts of Derbyshire. In half the families who were taken as fair types of the condition of the poorer laboring class, beer formed no part of the household dietary.

In the case of out-door laborers, where there is not much meat used, it is all cooked for the Sunday's dinner, usually the only one at which the whole family is collected and sits together in unwonted ease. What is left from the Sunday dinner is on the following week-days the husband's, and whether he take it with him bit by bit to his daily dinner in the fields, or eat it at home, it is his, as a matter of course, ungrudged. The household faith is "that the husband wins the bread, and must have the best food." His physical well-being is the prop of the house. If he have eaten up his remainder of meat or bacon by the middle of the week, and there be butter or cheese, he takes that for his dinner at the close of the week, and the wife and children at home are then reduced to dry bread, which is converted into a hot meal by the use of tea.

Of course this state of affairs is a great hindrance to marriage. A man alone can subsist comfortably, and the temptation to remain single is reluctantly overcome, when by marrying he is certain to deprive himself of food absolutely necessary to health. The farm-laborer, apart from a family, is adequately fed, long lived, and little troubled with sickness. When he takes his meals at the farm-house, his risk in the way of diet is from over-feeding. He has usually four meals a day—meat and bacon once, twice, and even three times a day; milk twice a day; puddings or pies three times a day in Devon, and usually daily elsewhere; beer also or cider. In Yorkshire he is found to get cheese-cakes and custards almost daily at breakfast and dinner, or even to take an hour's nap after dinner. He objects to mutton because it is fat, and throws the fat under the table. Living in this sumptuous manner, he will put off as far as possible the evil day which shall bring poverty and starvation. Comment upon this state of society is needless, but it is with gratitude that we compare the happiness of our own working-people with that of the English poor. The emigrant bound for America, even in these troublous times, may well be regarded as both wise and prudent.

Preparation of Blue Ink.

Prussian blue dissolves in oxalic acid, giving a dark blue limpid liquid. This interesting discovery of MM. Stephen and Rasch, patented in England in 1837, is of great interest in tinctorial chemistry, as by its means Prussian blue may be very simply used in the form of a solution. To dissolve commercial Prussian blue in oxalic acid, first mix the blue with concentrated hydrochloric or sulphuric acid, then add an equal weight of water, leave to digest for forty-eight hours, then carefully extract all the acid by repeated washings. This process being minute and tedious, it is better to employ recently-precipitated Prussian blue, which does not need the previous treatment by a concentrated acid.

By the following process Vogel has always obtained a good solid blue ink with Prussian blue and oxalic acid:—

Dissolve in a matrass, in a large quantity of water, ten grammes of sulphate of protoxide of iron; boil, and then add sufficient nitric acid to sesquioxidise all the iron. Then add a solution of yellow prussiate of potash containing ten grammes of this salt, and leave the precipitate to deposit. After decanting the supernatant liquid, throw the deposit on a filter, wash with cold water, and leave it to drain until it can be easily raised from the filter with a knife; then, without further dryness, mix it in a porcelain mortar with two grammes of oxalic acid in crystals. Let the reaction continue for an hour, then gradually add 400 cubic centimetres of water. A dark blue solution is thus obtained, in which even after long standing no precipitate is to be found. This blue ink will not bear the least addition of black gall-nut ink; it is even advisable not to use a pen retaining a particle of this black ink.—*Moniteur Scientifique*, vi. 666, 64.

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REPORT OF THE SECRETARY OF THE NAVY.

From the report of Hon. Gideon Welles, Secretary of the Navy, made to Congress on the 6th of December, 1864, we make the following extracts:—

THE NAVAL FORCE.

The subjoined statements present a general exhibit of the navy, including vessels under construction on the 1st of December, 1864, with a comparative statement of the navy in December, 1863 and 1864.

A tabular statement is appended of the number of naval vessels, of every class, that have been constructed since March 4, 1861:—

GENERAL EXHIBIT OF THE NAVY, INCLUDING VESSELS UNDER CONSTRUCTION DECEMBER, 1864.

Description.	No. of Vessels.	No. of Guns.	No. of Tuns.
Screw steamers specially constructed for naval purposes	113	1,426	169,231
Paddle-wheel steamers especially constructed for naval purposes	52	524	51,873
Iron-clad vessels	71	275	80,596
Screw steamers, purchased, captured, etc., fitted for naval purposes	149	614	60,384
Paddle-wheel steamers, purchased, captured, etc., fitted for naval purposes	174	921	78,762
Sailing vessels of all classes	112	850	69,549
Total	671	4.610	510,396

COMPARATIVE STATEMENT OF THE NAVY, DECEMBER, 1863 AND 1864.

Description.	No. of Vessels.	No. of Guns.	No. of Tuns.
Total navy, December, 1864	671	4,610	510,396
Total navy, December, 1863	588	4,443	467,967
Actual increase for the year	83	167	42.429
Total loss by shipwreck, in battle, capture, etc., during the year	26	146	13,084
Actual addition to navy from Dec., 1863, to Dec., 1864	109	313	55,513

VESSELS CONSTRUCTED FOR THE NAVY SINCE MARCH 4, 1861.

Description.	No.	Guns.	Tunnage.
Screw sloops, Ammonoosuc class, 17 to 19 guns, 3,213 to 3,713 tuns each	7	121	23.637
Screw sloop Idaho, 8 guns and 2,638 tuns	1	8	2,638
Screw sloops, spar deck, Java class, 25 guns and 3,177 tuns each	8	200	25,416
Screw sloops, spar deck, Hassalo class, 25 guns and 3,365 tuns each	2	50	6,730
Screw sloops, clippers, single deck, Contoocook class, 13 guns and 2,348 tuns each	10	130	23,480
Screw sloops, Kearsarge class, 8 to 12 guns, averaging 1.023 tuns each	4	40	4,092
Screw sloops, Shenandoah class, 8 to 16 guns, 1,367 to 1,533 tuns each	6	74	8,584
Screw sloops, Ossipee class, 10 to 13 guns and 1,240 tuns each	2	23	2,480
Screw sloops, Serapis class, 12 guns and 1,380 tuns each	8	96	11,040
Screw sloops, Resaca class, 8 guns and 831 to 900 tuns each	4	32	3,462
Screw sloops, Nipsic class, 7 to 12 guns and 593 tuns each	8	72	4,744
Screw gunboats, Unadilla class, 4 to 7 guns and 507 tuns each	23	123	11,061
Screw tugs, Pinta class, 2 guns and 350 tuns each	9	18	3,156
Screw tugs, Pilgrim class, 2 guns and 170 tuns each	2	4	340
Paddle-wheel steamers, double-enders, Octorara class, 7 to 11 guns and 730 to 955 tuns each	13	97	11,024
Paddle-wheel steamers, double-enders, Sassacus class, 10 to 14 guns and 974 tuns each	26	272	25,324
Paddle-wheel steamers, of iron, double-enders, Mohongo class, 10 guns and 1,030 tuns each	7	70	7,210
Paddle-wheel steamer, of iron, double-ender, Wateree, 12 guns and 974 tuns	1	12	974
Total	141	1,442	175,986
IRON-CLAD VESSELS.			
Sea-going case-mated vessels, Dunderberg and New Ironsides	2	28	8,576
Sea-going turret vessels, Puritan, Dictator and Roanoke	3	12	9 733
Double-turret vessels, Kalamazoo class, 4 guns and 3,200 tuns each	4	16	12,800
Double-turret vessels, Monadnock class, 4 guns and 1,564 tuns each	4	16	6,356
Double-turret vessel, Onondaga, 4 guns and 1,250	1	4	1,250
Double turret vessels, Winnebago class, 4 guns and 970 tuns each	4	16	3,880
Single-turret vessels, Canonicus class, 2 guns, and 1,034 tuns each,	8	16	8,272
Single-turret vessels, Passaic class, 2 to 4 guns and 844 tuns each	9	21	7,596
Single-turret vessels, Yazoo class, 1 to 2 guns and 614 tuns each	20	35	12,280
Single-turret vessels, Sandusky and Marietta, 2 guns each	2	4	953
Single-turret vessels, Ozark, Neosho and Osage, 2 to 8 guns each	3	13	1,624
Casemated vessels, Tuscumbia and Chillicothe, 5 and 3 guns respectively	2	8	768
Total	62	189	73,988
Aggregate	203	1,631	249,974

The foregoing tabular statement exhibits the number and description of vessels that have been constructed, or put in the course of construction, for the navy since the institution of active measures for the suppression of the rebellion. Some of them have been built by contract; others by the Government, in the several navy-yards. If we add to the number those constructed under similar circumstances, and within the same period, that have been lost by shipwreck, in battle, etc., viz:—The sloops *Housatonic* and *Adirondack*, and the iron-clads, *Monitor*, *Weehawken*, *Keokuk*, *Indianola* and *Tecumseh*, the aggregate would be 210 vessels, 1,675 guns, and 256,755 tuns.

Picket boats and small craft built for especial purposes, are not embraced in this statement.

EXPENSES AND ESTIMATES.

On the 1st of July, 1863, there was an unexpended balance standing to the credit of the Department of	$39,101,970
The appropriations for the fiscal year ending June 30, 1864, were	76,663,567
Total available means	115,765,537
The expenditures of the Department during the same time, were	85,733,292
Leaving a balance at the commencement of the present fiscal year of	30,032,244
The appropriations for the current year are	109,256,814
Making the total available resources for the fiscal rear ending June 30, 1865	139,289,059

The estimates submitted for the fiscal year ending June 30, 1865, are as follows:—

Pay of the navy	$23,327,722
Construction and repair of steam machinery	17,145,000
Construction and repair of vessels	24,530,000
Ordnance and magazines	9,187,615
Fuel, hemp and equipment of vessels	14,050,000
Provisions and clothing	13,923,280
Navy-Yards and superintendents	4,577,313
Navigation and Naval Academy	562,626
Surgeons' necessaries and hospitals	315,000
Marine corps	1,599,087
Contingent and miscellaneous	2,970,018
Total	$112,187,663

The expenditures of the Department since the 4th of March, 1861, have been as follows:—

From 4th of March to close of fiscal year, June 30, 1861	$6,244.357
For fiscal year ending June 30, 1862	42,200,529
For fiscal year ending June 30, 1863	63,211,105
For fiscal year ending June 30, 1864	85,732,292
From July 1, 1864, to November 1, 1864	41,257,978
Estimated expenditures from November 1, 1864, to March 4, 1865	42,000,000
Total for four years	$280,647,261

This exhibits an average annular expenditure, through four years of expensive war, prosecuted under many and great disadvantages, of $70,161,813. Could the transactions of the Department have been conducted on the true standard of value—that of gold and silver, or of paper convertible into money at the will of the holder—our naval war expenses would scarcely exceed, perhaps not equal, the current expense of either of the great maritime Powers during the same period. There is also this great difference—those Powers had a navy already constructed and in commission. We have had to create and pay for one in addition to our annual current war expenses. Were the cost of our vessels deducted from the amount above stated, the expenses of this Department would fall millious below those of other Governments. As the vessels which were built and purchased have an intrinsic value, the money paid for them may be considered to be well invested.

The conditions of the currency, which has enhanced the cost of all materials and supplies, has swelled the naval expenditures many millions, while the failure to pay promptly and when due the bills of contractors and others, has still further increased the aggregate of expenditures and augmented the difficulties in the work of creating and organizing the naval forces.

REPORT OF THE SECRETARY OF THE INTERIOR.

From the report of the Hon. J. P. Usher, Secretary of the Interior, made to Congress on the 6th of December, 1864, we take the following extracts:—

THE PUBLIC LANDS.

During the last ten years the income from lands were less than during the preceding decade. This was occasioned by the large quantities of land—granted for internal improvements, and for military and other purposes—which have competed in the market with the lands of the United States; and, more recently, by the passage of the Homestead law, under which large quantities have been entered at nominal rates. The annual receipts from ordinary sales for four years past have been as follows:—

For the year ending June 30, 1861	$884,887 03
For the year ending June 30, 1862	125,048 30
For the year ending June 30, 1863	136,077 95
For the year ending June 30, 1864	678,007 21

The depressing influences of civil war have been felt during the last three years, but the results for that just closed demonstrate a revival of the annual demand for the public lands, particularly for settlement and cultivation.

During the year ending June 30, 1864, public lands have been disposed of as follows:—

Acres sold for cash	432,773 90
Acres located with military warrants	515,900 00
Acres located with agricultural scrip	214,418 14
Acres certified to State for railroads	857,180 87
Acres taken under the Homestead law	1,261,592 61
Acres disposed of during the year	3,281,865 52
During the quarter ending September 30, 1864, the aggregate quantity taken for the same purpose was	939,476 90
Making a total of	4,221,342 42

The cash receipts for sales, homestead and location fees for the same five quarters, were $1,019,446 44. The aggregate quantity of public lands surveyed, but not disposed of, was, on the 30th of September last, 133,517,587 acres. This has been the average quantity for several years past. The amount surveyed annually has been about equal to that disposed of annually.

Nineteen States have accepted the provisions of the acts donating lands "for the benefit of agriculture and the mechanic arts," and have received land and land-scripts amounting to 4,950,000 acres.

DISCOVERIES OF PRECIOUS METALS.

During the past year additional discoveries of precious metals, particularly of silver, have been made in the region flanking, on the eastward, the extended mountain ranges of the Sierra Nevada. A vast belt of some one or two hundred miles in width, and eight or nine hundred in length, embracing portions of Idaho, Nevada and Arizona, is rich in silver ore. Owing to the remote locality of these mines, and the difficulty of transportation thereto, but little machinery well adapted to the rapid and economical reduction of the various ores has been introduced. In that portion of Nevada through which the Pacific Railroad will pass, many rich veins have been found, and it is estimated by persons familiar with the subject, that if the mines now opened there were supplied with the proper machinery, they would yield ten millions of dollars per month. In the same region vast beds of salt have also been found, which from its value in the process of separating the silver in the ores, has given a fresh impulse to mining. When we reflect that the region of country in which deposits of the precious metals abound, includes large portions of three States and six Territories, and that the richest veins of ore heretofore discovered, are as yet but slightly developed, while new discoveries are constantly made, it will be perceived that the annual product of the mines in the United States must soon reach a magnitude without precedent in the history of mining operations.

The wealth imbedded in the rocks of that extensive region is actually inexhaustable, and it will furnish in future years, indirectly, a principal part of our means of liquidating the debt contracted by the Government for the overthrow of the great Rebellion.

THE PACIFIC RAILROAD.

It appears from a communication to Gen. Dix, the President of the Union Pacific Railroad Company, that it has, since the adjournment of Congress, expended more than half a million of dollars upon the main line of the road leading westward from Omaha, of which one hundred miles have been permanently located, and forty miles are in process of construction.

The company has surveyed lines to Salt Lake City, through the South Pass Laramie plains, Bridger's Pass, by way of Timpanagos and Weber rivers, to determine the most feasible route. Parties have also been engaged in explorations in Colorado Territory through Berthold's Pass and up the Cache la Pendre river, and also in examining the topography of the country in the vicinity of the 100th meridian of longitude, and in locating the line from Omaha to Fort Kearney. Considering the limited time which has elapsed since the action of Congress enabled this Company to prosecute the work with energy, satis-

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factory progress has been made, and the country has no reason to apprehend any tardiness in the prosecution of this great enterprise.

The progress made in the construction of the branch road in Kansas, known as the Union Pacific Railroad, eastern division, has not met the reasonable expectations of the public. There was just reason to believe that the second section of forty miles of that road would have been rapidly approaching completion, if not actually completed by this time, instead of which forty miles only of the track are laid, and that not yet in a condition to be examined by the commissioners appointed by the President to inspect and report upon the work.

For this unexpected state of affairs the company is not altogether without excuse. The assassination of its contractor in July last, soon after the adjournment of Congress, the continued insurmountable difficulties of obtaining the necessary materials, either by river or rail, from causes known to all, prevented them for a time from prosecuting the work. Since these difficulties have been partially removed a commendable energy has marked the conduct of the company. The first section of the road to Lawrence, to which place the track is laid, will undoubtedly be open to the public and in use within a few days. The company in California is also making satisfactory progress with its portion of the road.

PENSIONS.

The liberal provisions of law for the payment of pensions to soldiers and seamen who have been disabled in the service of the country, and to the widows, orphans, and dependent mothers and sisters of such as have fallen in battle or died of disease or wounds, have been administered with industry, fidelity and promptitude.

Of those patriots to whom pensions for services in the Revolutionary war had been awarded, five still survive at very advanced ages. At the beginning of the year twelve were living, and 1,418 widows of Revolutionary soldiers were receiving pensions, making 1,430 pensioners of this class—the aggregate of whose yearly stipends was $115,217.

The number of army pensioners (other than Revolutionary) who were paid during the fourteen months ending the 30th of June last was 22,767, and of widows (other than Revolutionary), orphans and dependent mothers, 25,433.

The total number of persons who received pensions during that period was, therefore, 49,630, and the amount paid for army pensions during the year ending June 30, was $4,340,368.

The number of navy pensioners who were paid during the fourteen months preceding the date mentioned was 1,505, and the amount of money paid them during the year was $164,247. The whole number of pensioners on the 30th of June last was 51,135, requiring for their annual compensations $4,595,376.

During the year ending Sept. 30, 1864, 1,812 bounty land warrants were issued, requiring 286,960 acres of land to satisfy them.

The act of Congress approved July 14, 1862, entitled "An act to grant pensions," is believed to be one of the wisest and most munificent enactments of the kind ever adopted by any nation. Its beneficial provisions extend to the disabled survivors, and to the widows, orphans, dependent mothers and dependent orphan sisters of the deceased soldiers and seamen of every grade and rank.

During the past year more than $3,500,000 have been paid for pensions granted on account of disability or death ensuing from service in the war of the rebellion. During the continuance of the war no reliable estimate can be made of the amount of money that will be required eventually to meet the obligations thus assumed by the Government to our soldiers and seamen.

The list of pensioners is constantly undergoing both increase and diminution, and at present, and for months to come, it must be rapidly augmented, even should peace be restored without further hostilities. It is estimated that more than $7,000,000 will be required to satisfy the claims accruing under the pension laws during the current fiscal year.

THE movement for restricting the working-day to 8 hours is making rapid progress; it is stated that most of the leading manufacturers in Paris have agreed to the change.

REPORT OF THE SECRETARY OF THE TREASURY.

The second session of the XXXVIIIth Congress of the United States of America commenced on Monday, the 5th day of December, 1864. In accordance with the requirements of law the members of the Cabinet transmitted reports to Congress, giving detailed statements of the condition of their several Departments, with a history of their operations during the past year. From the report of the Secretary of the Treasury we gather the following particulars:—

RECEIPTS AND EXPENDITURES FOR THE YEAR ENDING JUNE 30, 1864.

RECEIPTS.

Customs	$102,316,152 99
Lands	588,333 29
Miscellaneous	47,511,548 10
Direct Tax	475,648 96
Internal Revenue	109,741,134 10
Total	$210,632,717 44
Add balance July 1, 1863	5,329,044 21
Aggregate	$265,961,761 65
From Loans	618,114,884 92
Total	$884,076,646 57

EXPENDITURES.

Fiscal Service	$2,755,599 46
Pensions and Indians	7,517,930 97
War Department	690,791,842 97
Navy Department	85,733,292 77
Interest on Debt	53,635.421 69
Total	$865,234,087 56

THE PUBLIC DEBT.

The public debt, as stated by my predecessor in his report of Dec. 10, '63, was	$1,098,793,131 37
To this amount should be added amounts paid into the Treasury previous to July 1, 1863, for which evidences of debt were subsequently issued	23,782,423 20
Amount of debt July 1, 1863	$1,122,575,604 57
Add amount of loans applied to actual expenditures as above, and balance in the Treasury July 1, 1864	618,114,884 92
It gives the amount of public debt July 1, 1864	$1,740,690,489 49

THE CURRENCY.

The whole amount of national circulation not bearing interest, exclusive of fractional currency and of notes issued by National Banks, is limited to $400,000,000, subject to slight occasional increase from the fifty millions held in reserve for the payment of temporary deposits. Of five per cent. interest-bearing notes, there were outstanding on the 1st of November last, $120,519,110. To a considerable extent, these notes have been, and will continue to be, used as currency. Those with coupons have been found particularly objectionable. As though withdrawn to a certain extent, while the interest was maturing, they are liable to be periodically rushed upon the market. In consideration of this feature, a large amount, viz.:—about ninety millions of the original issue of $150,000,000 of these coupon notes—have been withdrawn and destroyed, and their places occupied by notes payable in three years bearing interest at six per centum, compounded semi-annually. This is believed to be the best form of interest-bearing legal-tender notes, as being more likely to be withdrawn and held until maturity as an investment. Of these $15,000,000 in amount were issued under the act of March 3, 1863, and about $90,000,000 under the act of June 30, 1864. The total amount of interest-bearing notes outstanding on the 22d of November last was $210,222,870. What proportion of these may be considered as an addition to the circulation I am unable to determine. To that extent, whatever it may be, they contribute to the amount of the currency, and thus in some degree occasion, and in a still greater degree sustain, an increase of the prices and depress values.

The amount of bills issued to the national banks, as appears from the books of the Comptroller of the currency, was, up to the 22d of November, inclusive, $65,160,210. As these banks have absorbed capital which might otherwise have been invested in State corporate institutions, and, in many instances, have taken the place of those institutions by conversion, these issues cannot be regarded as so much addition to the body of currency. The returns on file at the Department show that the whole circulation of the State banks on the 1st of January, 1864, was $169,926,129, while the whole circulation of such banks for the month of July, 1864, returned to the Internal Revenue Bureau, and which embraced, with a few trifling exceptions, all of these institutions outside of the rebellious States, was only $126,196,606 72. The diminution is $43,729,522 28, which deducted from $65,160,210, leaves $21,436,687 72 as the amount of increase to November 22, 1864.

COST OF THE WAR.

The Secretary states the current expenses of the Government at $2,250,000 per day. This for 20,000,000 of people is equal to 11 cents apiece.

FURTHER EXTRACTS FROM PROFESSOR TREADWELL ON HOOPED CANNON.

THE TRANSVERSE AND LONGITUDINAL STRAIN.

Let us suppose that we have a hollow cylinder, say twelve inches long, the caliber being one inch in diameter, and the walls one inch thick, giving an external diameter of three inches. Suppose this cylinder to be perfectly and firmly closed, at its ends, by screw plugs, or any other sufficient means. Let this be filled with gunpowder and fired. The fluid will exert an equal pressure, in every direction, upon equal surfaces of the sides and ends of the hollow cylinder. Let us next examine the resisting power of a portion of this cylinder, say one inch long, situated in the middle, or equally distant from the ends, so that it shall not be strengthened by the iron which is beyond the action of the powder. The fluid, inclosed by this ring of one inch long, contains an area of one square inch, if a section be made through it in the direction of its axis; and the section of the ring itself, made in the same direction, will measure two square inches. We have then the tenacity or cohesive force of two square inches of iron in opposition to an area of the fluid measuring one square inch, and if we take the tenacity of the iron at 65,000 pounds, the cylinder will not be burst, in the direction of its length, unless the expansive force of the fluid exceed 130,000 pounds to each inch. Next, let us suppose a section made through the cylinder and the fluid, transversely. The area of the fluid, equal to the square of the diameter of the hollow cylinder, is one circular inch, and the area of the whole section is, the diameter being three inches, nine inches. Deduct from this the area of the caliber, and we have eight circular inches. That is, the section of the iron is eight times greater than that of the fluid; whereas in the former case, of longitudinal section, the iron gave but twice as much surface as the fluid, and if we take, as before, the iron at 65,000 pounds per inch cohesive force, it will not be broken unless the force of the fluid exceed 520,000 pounds. It will be found, upon a further examination, that the relations of these sections to each other may be varied, as we take the diameter of the caliber to be greater or less, as compared with the thickness of the sides, but their difference can never be made less than as two to one.

Having been aware of the fact here stated, and, I trust, in a manner which can be easily understood and appreciated, for many years, I determined, between four and five years ago, to attempt to apply it, practically, to the fabrication of cannon. My first attempt was to make a four-pounder cannon, by the best means then at my command, of rings or short hollow cylinders joined together end to end by welding. Each ring was made of several thinner rings, placed one over the other and welded. It will be seen that, in this case, as the bars of which the several rings were formed were curved round the caliber, the directions of the fibers herein shown to be so essential was fully preserved. I may remark here, that this method was subsequently changed in some degree, by first making a single thin ring of steel, and upon the outside of this winding a bar of iron spirally, as a ribbon is wound upon a block. This gun, although imperfectly made, withstood the action of enormous charges of powder, and was only burst by using very superior powder, and shot without windage. The fracture was made lengthwise of the gun, or across the fibers of the iron, and although the welds (technically called jumps) which united the rings to each other endwise, were most imperfect, they yet held together completely against the action of the powder.

THE PRESSURE OF GUNPOWDER.

The expansive force of gunpowder, which must be resisted by the strength of the cannon, depends almost entirely upon the circumstances under which it is fired. Count Rumford has shown, by his experiments made about seventy years ago, that if the powder be placed in a closed cavity, and the cavity

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be two-thirds filled, the force will exceed 10,000 atmospheres, or 150,000 pounds upon the square inch; and he estimates that if the cavity be entirely filled with the grained powder, and restrained to those dimensions, the force will rise to 50,000 atmospheres. My own experience, made in bursting wrought-iron cannon the strength of which was known to me, leads me to believe that he has not over-estimated its power, although I am aware that it is generally considered as excessive. If, following an opposite course to that herein described, the powder be at liberty to expand upon any side, the force thrown in the other directions is very small. Thus, if a charge be placed loose in a gun, without shot or wad, the force upon the walls of the gun is very trifling; no more than is produced by the restraint of the inertia of the charge itself, or the fluid formed from it. If we would divest a charge of this property of inertia, and fire it in a constantly maintained vacuum, it would not rend walls made of cartridge-paper, if a single end were left open for its escape. From the preceding statement, it will be seen that gunpowder will take any force, from perhaps 50,000 atmospheres, when confined to a close cavity, down to zero, if it be deprived of inertia and fired in a vacuum constantly maintained.

To be continued.

Correspondence

The Coffee Tree and Tea Plant.

Messrs. Editors:—I have noticed some erroneous statements which have crept into your estimable journal. I ask permission to correct them.

The Coffee Tree.—Of this tree my father-in-law possessed a plantation of 240,000 trees in Cuba, and I am perfectly familiar with its character. It is a native of Yemen, in Arabia, and of course is tropical. It is so tender that I have had trees ten years old killed by the slightest frost. All the theories about its probable naturalization in our country, which have from time to time appeared in the public prints, are visionary. It is merely possible that this tree might be kept alive on the extreme point of Florida, but certainly nowhere else. It is an evergreen tree of much beauty. The berries are a brilliant red, and the blossoms yield a most exquisite jasmin-like odor. Nothing can surpass the delicious fragrance which one enjoys when passing through a coffee field at its period of blossom. The coffee bean grown in the Connecticut valley may prove a good substitute for coffee, but I think nothing will be found to fulfil that office so well as barley, which, I think, ought to supersede the imported article for our domestic use. Chicory, or *cichorium intybus*, is grown, you are aware, to an immense extent in Germany, and used as a general substitute for coffee. It is a plant of the easiest culture, and can be grown with very little care in any but a sandy soil. It prefers, however, a substantial soil that is reasonably moist. I see no reason why its culture may not become general. It is found growing vigorously along the roads of this island, from seeds which the winds have scattered.

Tea Plant.—I notice a remark in your paper that tea grows in Pennsylvania, which probably was based on an assertion made by an inhabitant of that State, which was extensively published about two years ago. Such, however, is not the fact. The plant that the writer had reference to is the *Ceanothus Americanus*, or New Jersey tea or red root. It acquired its name in consequence of its leaves having been used in New Jersey, and probably elsewhere, as a substitute for tea, during the Revolutionary War. It is a suffruticose plant, found in plenty from Canada to Florida. The most appropriate American substitute for tea would be the *Ilex cassine*, or Yapan tea, of North Carolina, which was in use among the Indians there before the white man trod its soil, and is now universally used by the negroes. It forms a regular article of sale in the country stores of that State. In Paraguay they use the leaves of a tree of the same genus as tea, whose name is *Ilex Paraguayensis*. Of the genuine tea tree there are upon our globe but three species, and they are all natives of Asia: *Thea Bohea*, with narrow, deep-green leaves, and *thea viridis*, with broad, pale-green leaves, both of which are natives of China, and *thea Assamica*, or Assam tea, grown extensively in Assam, under British control, and which is highly esteemed in England. In Japan they use for the same purpose the *camellia sasanqua*, a vigorous-growing evergreen shrub. All the four preceding species could be cultivated successfully in the States south of Virginia, and we must not forget to form plantations of these valuable species when we are recolonizing those States.

Wm. R. Prince.

Linnæan Nurseries and Gardens, Flushing, L. I., Nov. 28, 1864.

The Atwater Gun.

Messrs. Editors:—In your issue of Nov. 12th, you publish a letter from Mr. H. W. S. Cleavland, "exposing a piece of deception" in a test of the Atwater rifle, which took place in his shooting range, of which he was "a victim." As I was the party who conducted the test of the Atwater gun on the occasion referred to, and the one therefore chiefly responsible for the pretended fraud on the credulous and conscientious gentleman, I ask a brief space in your columns to defend myself. The balls used in the test to which Mr. Cleavland refers, were cast out of balls of the Minie pattern, purchased by me in a gun store in Boston; they had been once used in experiments with a Springfield rifle. If they contained tin in greater or less quantities I had no knowledge of the fact. I supposed them to be lead of the usual softness. The "discovery," however, in reference to the ball, explains a mystery which has long puzzled me. That neither of the Atwater guns tested before Mr. Cleavland on that day obtained their usual penetration by forty per cent, a circumstance which Mr. Cleavland will remember I remarked to him at the time, convinces me that the diminished penetration must have been owing to the reduced weight consequent upon the extraordinary alloy of tin found by Mr. Cleavland. I do not accept Mr. Cleavland's theory, that the harder the projectile the greater the penetration. Even Mr. Whitworth, who confessedly uses tin to harden his bullets, introduces but one part tin to nine parts lead. (Scott's Military Dictionary, page 525.) If the balls used by me did contain 51 parts of tin, the gain in hardness would not, in my opinion, by any means compensate for the loss of weight, in not using soft lead balls of the same dimensions, particularly when firing, as in this case, at a soft pine target. The best penetration made on that day was but 16 inches. In a test at Chicago, before Brig. Gen. J. D. Webster, now at Nashville, Tenn. (to whom I will take the privilege of referring Mr. Cleavland for the correctness of my statement), this same gun, with a loaded ball, made a penetration of 26½ inches. In speaking of this test, Mr. Cleavland, on page 86, of his Hints to Riflemen, remarks:—"This is more than double the average of the Springfield rifle; but is not equal to the best record of the Whitworth." I will only say that a 6-inch gun, rifled on the principle, is now in the Washington Navy Yard. The official report of the test of this gun has already settled the question of merit; which report when published will relieve Mr. Cleavland from all responsibility of "propagating an innocent deception. W. H. Butler.

Lafayette, Ind., Nov. 28th, 1864.

Gold Fish.

Messrs. Editors:—I had intended giving you all the information I could on gold fish, as I saw some inquiries on the subject, but have only time to state that in my younger days I have fished for hours in the warm water ponds of one of the principal manufacturing districts of Yorkshire, England. In the large warm water dams they breed very rapidly; I have seen them on a bright clear summer's day spread out in a shoal like a large carpet. They vary from one inch to one foot in length. In small ponds where the water becomes very hot the fish are very small. They will live, I have heard it said, after being taken out of a solid lump of ice, and I know from observation that they will stand an incredible degree of heat. They change color three times. The young gold fish is black; he gradually changes to a gold color of every shade to crimson; then his belly will get white or pearl color, and lastly, he will become white all over. Dough is the best bait. I never knew them to breed in cold water. I have kept them for four years in clear hard well water without any kind of food. They become very thin, however, when kept so long in a glass globe in the house with nothing except a few moss covered oyster shells in the water. The fish which I had became black-spotted when old; I think it was some peculiarity in the water, probably an excess of sulphur or iron. I believe three or four gold fish might be kept for ten years in a glass globe or aquarium that would hold but one pail of water. The water should be changed once a week. The white of an egg thrown in occasionally would help to keep the fish fat; or a crumb of bread, a crumb only. Too much food would puff them up and kill them in quick time.

Wm. Hill.

Noblesville, Ind., Nov. 30, 1864.

Reduction of Chloride of Silver.

Messrs. Editors:—In the Scientific American, of Oct 28th, page 229, I find an article headed "Coal and Coke," and I think you would not let such an article appear in your paper if you had properly examined it, for chloride of silver is never reduced in the fire by any scientific man, it being a very volatile product, and as I feel quite sure that such a man as Professor Seely would never attempt anything of the kind, as he would know the great loss attending any such operation, and, I should suppose, would at once correct any such error, for an intense heat is not requisite for that purpose.

L. B. Darling.

Providence, R. I., Dec. 1, 1864.

Messrs. Editors:—Mr. L. B. Darling, of Providence, has politely furnished me with a copy of a letter which he has addressed to you, concerning the reduction of chloride of silver. If you find it worth while to publish his letter please allow me to make the following explanation:

The chloride of silver which I have occasion to reduce comes into my hands contaminated with the compounds of silver, and dirt in various forms. It is known as photographers' waste. I know of no way of profitably extracting the metal from such material except by fire.

I seldom have pure chloride of silver; but that also I reduce by heat; no method with which I am acquainted answers the purpose better for me. I am aware that at the mint and some other very large refineries, the silver is precipitated from the chloride in the cold by zinc, not so much, I suppose, on account of loss of silver in the furnace process, but from other combinations which it is not necessary to name.

Chloride of silver is volatile to some extent, but when it is properly united with carbonate of soda the metal will be reduced by heat before a temperature could be reached which would volatilize the chloride. The temperature required practically for the process must evidently be that of melted silver; the metal is first reduced atomically at a moderate heat, when the heat being raised the particles of silver are brought into one mass.

I am aware that the loss of silver is often serious in attempts to reduce it from the chloride by heat, but I am of the opinion that in such cases it might be shown that the loss was due not to volatility of the chloride, but to unskillful mixing of the flux or mismanagement of the fire.

Charles A. Seely.

New York, No. 244 Canal street.

Rule for Measuring Cisterns.

Messrs. Editors:—I see on page 339, current volume of the Scientific American, a good rule for the measurement of corn in the crib. A small allowance ought, however, to be made, since it does not require twice as much corn on the cob to make a bushel as when shelled and in large bulks. In barrels or baskets it does, but in larger quantities the corn lies closer. The allowance, however, is small, not over three or four bushels in a hundred, and varies with the quality of the corn. But I have written this to send you a similar rule for the measurement of cisterns, as follows:—

Rule for the Measurement of Cylindrical Cisterns,—Take the length, width and depth in feet; multiply these together, and the product by 1,865; cut off four figures on the right, and the result will be the contents in barrels. Example.—Find the contents of a cistern 6 feet in diameter and 9 feet deep. Six feet, the length, multiplied by 6 feet, the breadth,

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and the product by 9, gives the depth, 324, which multiplied by 1,865, and four figures cut off, gives 60 barrels and a decimal.

In this case we consider the diameter as being both length and breadth. The reason of the rule is this, a cylinder one foot in diameter and one foot long, would measure 1865 ten-thousandths of a barrel. A cylinder 9 times as long would contain 9 times as much, and 6 times as wide, 6 times as much as that. The number 1,865 is easy to remember, as it corresponds with the number of the new year.

W. W. M. M.

Salem, Nov. 30, 1864.

The Mast Crop of the West and its Commercial Value.

For the Scientific American.

The States of Tennessee, Kentucky, Ohio, Indiana, and some portions of Illinois and Missouri, were originally, and are now partially, covered densely with magnificent forest trees and beautiful shrubs. Many of these, such as the different varieties of the oak, the hickory, the black and white walnut, the beech, the chesnut, the pawpaw, persimmon, haw and the hazlenut, produce irregular but average crops of fruit, to which the western people give the general appelation of "mast." This term is well understood for a description of food furnished by provident nature for the subsistance of wild animals and birds during the winter months. It is also keenly relished by the domestic hog of the settler, the value of whose farm has been, and is at present, largely governed by the extent and productiveness of the timber tracts over which his hogs can range and feed without their costing him anything but the trouble of looking after them, lest they should wander from the neighborhood of their owner. As the chestnut delights in mountainous countries and poor soil, and as there is not even a respectable hill in Illinois, nor any chestnut-grove soil, this description of mast is entirely unknown to us. For some other natural reason the beech is not found in our forests, but the oak, hickory and black walnut, extensively diffused over Central and Southern Illinois, and on the bottoms of the Mississippi and Wabash Rivers, and their tributaries, amply supply its place. The walnut is the least valuable of the masts, the tree being comparatively scarce, the shell thick and hard, and the kernal hard and bitter. The hickory is very abundant, producing quite a variety of nuts, large and small, some with soft and others with hard shells, but all like the walnut, oily, and not calculated to produce a good article of pork for summer preservation, it being soft and dark colored in the fat, and only adapted for consumption in the winter and early spring months, when the meat is most excellent, having a peculiar sweetness not found when the hog is fed on any other description of food. But the most interesting and valuable of the western masts is the oak; its great abundance and general diffusion through the west—every soil on which timber grows producing some description of acorn—its variety, excellent quality and easy adaptation to the wants of wild and tame animals, renders its importance great to the western settler, and its immense commercial value commands a large amount of attention from collectors of statistics and political economists, with a view to its better preservation. The oak masts are divided into "sweet" and "bitter masts," the sweet masts being the acorn of the white burr, overcup and post oaks, the timber of which is of superior quality. The bitter masts are the acorns of the black, red, Spanish, water, pin and other oaks, whose timber is used for certain purposes, and is good in some places, but is not equal for general mechanical appliances to the sweet oaks. The great point of difference, however, between the sweet and bitter oaks is, the sweet perfect their fruit in one season, while the bitter require two seasons, and, in the long run, are the most valuable for feeding purposes, the trees being all rapid growers, and there being always a reserve of acorns on them. The quality of the pork from the bitter masts is about the same as from hickory, with the exception of the pin-oak pork which is claimed to be equal to the sweet oaks. This mast is the favorite acorn of the wild pigeon, which is sometimes found with twenty in his crop.

The pork made on the sweet masts is of a superior quality, and claimed to be equa in firmness to green corn fed. The western packers make great pretensions about their skill in detecting mast-fed pork, but they purchase from all heavily-timbered districts millions of pounds of it, and are glad to get it. The fact is, to make corn-fed pork such as we see that deluded individual, Uncle Samuel, advertise for in the newspapers, the feed must be corn one year old.

The mast crop is tender and uncertain, frosts and drought effecting it like any of our fruits. The hickory is very sensitive; there is, however, an average yield, some trees bearing well annually, some biennially, and some at uncertain intervals—nature, no doubt, refusing to load the branches with fruit which is not required, at the expense of the growth of the tree.

Well, as to the commercial value, the reader can figure for himself; millions of acres of land are covered with forests furnishing feed for hogs that are annually sold in market. This year, for instance, half the growth of 100,000 hogs may be credited to the "range." Those hogs average 200 pounds each, making 20,000,000 pounds, one-half of which is worth, at 10 cents a pound, $1,000,000!

In conclusion, if any of your readers should ever come west for farming purposes, take the advice of one who has spent thirty years taking notes—by all means purchase land where your hogs can have plenty of mast on the range—it costs nothing.

J. T. D.

Springfield, Ill., Nov. 26, 1864.

The Late Prof. Silliman.

At a meeting of the Chemical Society of Columbia College, held on Monday, Dec. 5th, the following resolutions of respect to the memory of Prof. Silliman were passed:—

Resolved, That in the death of the venerable Benjamin Silliman an event has occurred well worthy of the notice of this society; the life of this Christian gentleman and man of science offering to the student an elevated standard by which to guide his steps.

Resolved, That the youthful energy which induced him to prepare himself as a Lecturer on Chemistry, at a period when the facilities for a scientific education were so limited, entitles him to the gratitude of those who now profit by his pioneer labors.

Resolved, That by the establishment, in 1818, of the *American Journal of Science and Arts*, he added another claim to the gratitude of the scientific student, and earned a right, universally conceded, to give his own name to that periodical.

Resolved, That his life-long example as a polished, genial and Christian gentleman is a source of grateful recollection to this Association, as an evidence that the earnest seeker after scientific truth may, at the same time, cultivate the highest religious and social character.

Resolved, That the devotion to the highest welfare of his country and the cause of human freedom, displayed even in his latest days, commands the admiration and respect of this society.

Resolved, As a mark of respect to this wise and good man, and an incitement to future members of this Association to study his life and character, that these resolutions be entered on the minutes of the society and published.

SPECIAL NOTICE.

James M. Bottum, of New York City, has petitioned for the extension of a patent granted to him on July 15, 1851, and re-issued July 8, 1856, for an improvement in securing pinions, etc., of watches, in lathes.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, June 26, 1865.

All persons interested are required to appear and show cause why said petition should not be granted. Persons opposing the extension are required to file their testimony in writing at least twenty days before the final hearing.

CHEMICAL LECTURES BY PROF. DOREMUS.

We are very certain a simple announcement of the fact that Professor Doremus is about to give a course of lectures on Pneumatic Chemistry will be enough to secure the attendance of every city reader of the Scientific American. These lectures are to be illustrated by experiments on a large scale, and in the brilliant and lucid manner peculiar to Prof. Doremus.

Patent Office Statistics.

The Secretary of the Interior presents in his report the following summary of the operations of the Patent Office for the year ending September 30. During this period 6,740 applications for patents and 989 caveats were filed; 29 applications also were made for the extension of patents previously granted. During the same period 4,843 patents, including re-issues and designs, were issued, and extensions granted. The number of applications awaiting the payment of the final fee required by law before patents can be issued, has largely increased, numbering now over 1,000. The finances of the office are in a prosperous condition, as appears by the following short statement:—

The balance in the treasury to the credit of the patent fund on October 1, 1863, was $37,732 63. The receipts of the office to September 30, 1864, amounted to $230,838 60, making a total sum of $268,571 23. The expenditures during the same period were $212,453 84, leaving a balance of $56,117 39 on hand on October 1, 1864, being $18,384 76 more than the balance as exhibited on October 1, 1863.

Machinists' Slide Gage.

A very neat and convenient slide gage for machinists' use has been shown us by Mr. A. H. Kendall, agent for the manufacturers, R. C. Chandler & Co., Springfield, Mass. These gages are from 3 inches length of blade upward, and are graduated to 64ths of an inch on one side and 100ths on the other. The jaws are adjusted to fractional parts of an inch by a small thumb-screw, so that very minute divisions can be made. For measuring standard sizes, gaging taps or holes, and miscellaneous work of all kinds, these tools are very convenient. They are light and strong and can be carried in the vest pocket. The low price at which they are sold will commend them to many who cannot afford, or have no use for, a finer or more costly instrument. Messrs. Chandler & Co., also make machine screws and tools of all kinds

MISCELLANEOUS SUMMARY.

Borax to Kill Water Bugs.—At the last meeting of the Boston Society of Natural History, a report was made by a member upon the effect of pulverized borax upon the water bugs and cock-roaches that infest our houses. The experiment was tried by sprinkling it around every crack and crevice suspected of affording shelter to these insects, with this effect, that after three or four days quantities of dead ones were found on the floors, and hardly a live one found in the house.

Light Breakfast.—A custom is now becoming general in Paris for the workman to take a cup of coffee as soon as he rises, his *dejeuner* or breakfast at half past eleven or twelve, and his dinner at home with his family, after leaving work, at half past five or six.

[The work a man could do in five hours on a cup of coffee would'nt amount to anything.—Eds.

The Hygienic Cook Book.—Containing recipes for making bread, pies, puddings, mushes, and soups, with directions for cooking vegetables, canning fruit, with an appendix containing suggestions in regard to washing, bleaching, removing ink print and other stains from garments, etc. Price 30 cents. Miller & Browning, Publishers, No. 15 Laight street, New York.

The Philadelphia *Ledger* says that when it was started, in 1836, the united editions of all the daily newspapers of Philadelphia were between 7,000 and 8,000 copies a day. Now the whole number is about 175,000.

An aerolite which lately fell at Orgueil attracts the attention of the French chemists. M. Pisani has made an analysis, and proved the presence of soluble hyposulphites.

Rheumatism.—A correspondent of the Germantown *Telegraph* recommends the application of kerosene oil to the parts affected by rheumatism, as an effectual remedy for this painful complaint.

The product of oranges on many plantations in Louisiana will be this season much in excess of sugar and cotton.

Chlorate of potassium, with tincture of snake-root, is said to be successful in cases of diptheria.

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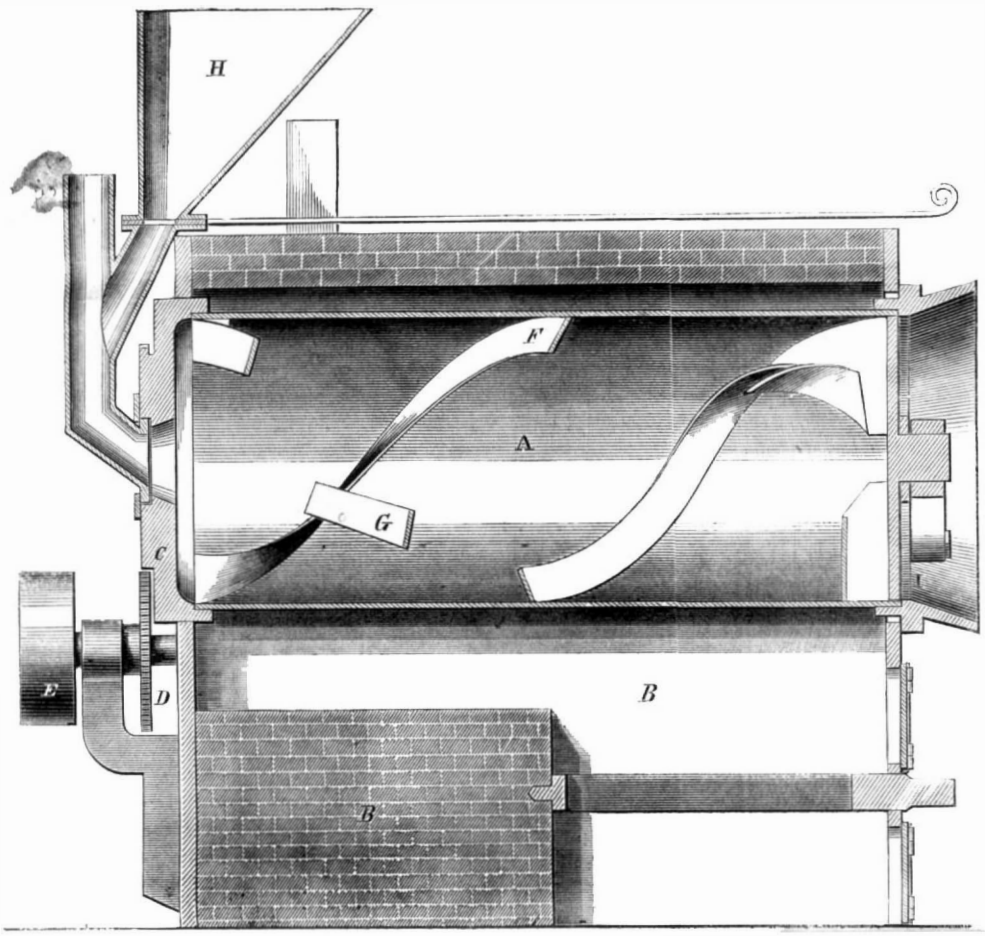
Improved Coffee Roaster.

It is well known that coffee requires great care in roasting, so that it will not be scorched and its flavor thus impaired. The mill herewith illustrated combines many excellent features relating to dispatch in the operation and insurance against burning. The following description renders the machine and its advantages intelligible. The cylinder, A, is set in the furnace, B, and is supported on each end by friction rollers set in the furnace walls. The cylinder rests on these rollers and has a cog wheel keyed or cast on the projecting flange, C. This wheel gears with the wheel, D, through which power is transmitted by a belt over the pulley, E. In the cylinder there are two screw blades, F and G, one of which is cut away to show the other. One of these blades works inside the other, and the object of them is to keep the coffee constantly moving; for, as it is pushed up to one end of the cylinder by one blade, it is immediately driven to the opposite end by the other blade, thus preventing scorching from long contact with the hot cylinder. The coffee is let into the cylinder from the hopper, H, and it is discharged from doors in the front, I, which can be opened without stopping the motion of the cylinder. In this way the coffee can be examined without stopping, and, if roasted sufficiently, immediately removed, as the rotating blades push it out into any receptacle placed beneath the doors. A fresh charge is then supplied and the operation progresses as before. A great saving of time and heat is effected by the use of this coffee roaster, as the cylinder need not be stopped or removed from its bearings during the whole process.



BURNS'S COFFEE-ROASTER.

A patent was procured through the Scientific American Patent Agency, on the 18th of October, 1864, by Jabez Burns, of New York city. For further information address him at 269 Washington street, as above.

On the Solubility of Gold in Nitric and Sulphuric Acids.

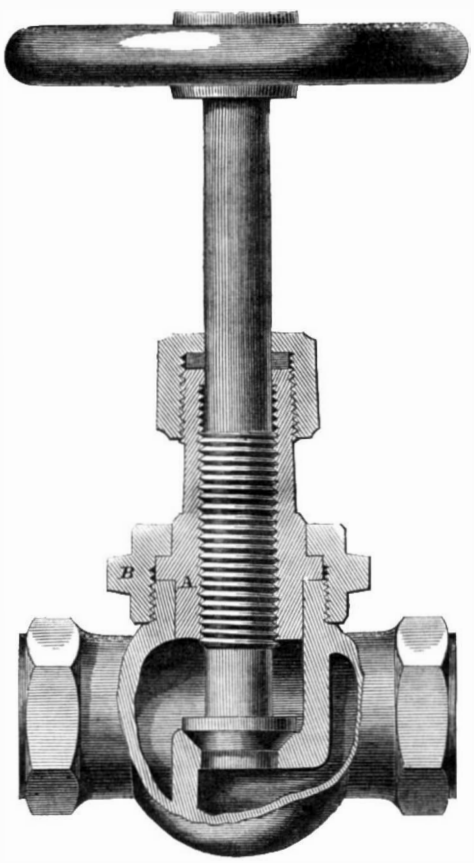
Since sending you the note on the solubility of gold, a chemist of my acquaintance has informed me that the information given was not sufficient to enable him to perform the experiment satisfactorily. I therefore send you a more complete account of the experiment performed by me.

The alloy of silver and gold was exposed to the action of nitric acid until the gold was left in a powder. On heating this powder with sulphuric acid a yellow solution was obtained, which, when poured into water, gave a purple precipitate. This at first led me to suppose that the sulphuric acid had dissolved some gold; so, after washing, the gold was heated for some time with strong sulphuric acid, without any solution taking place; but on adding a little nitric acid an immediate yellow color was observed in the liquid, and on pouring it into water the same blue precipitate was obtained. The experiment has been repeated, and the acids were of course tested to ascertain their purity; but the solution contains the gold evidently in a different state of combination from that produced by nitric and hydrochloric acids, for it is again precipitated by water.

A tenth of a grain was easily dissolved in this manner; but had the heat been continued no doubt a larger quantity would have been obtained in solution.—*Chemical News*, Oct. 1, 1864.

LUNKENHEIM'S GLOBE VALVE.

It is a difficult matter to grind an ordinary globe valve tight, for the action of turning the stem causes the valve to rise off of its seat, and out of contact with it. Neither can the valve be ground separately, nor disconnected from the stuffing box, for the motion of the hand is too unsteady, and valves so ground have oval seats. In the valve here shown a very



complete method for grinding it is provided. The nut, A, and the stuffing box the stem works through is in one piece. This nut is held down by the cap, B, when the latter is screwed up tight. If it be slacked off, however, the nut turns in the opening, and allows the valve to rotate freely on its seat, thus insuring a perfect guide in the same position that the valve is in when working. The plan of constructing this valve is simple and cheap, and will much facilitate the operation of grinding.

An application for a patent is now pending through the Scientific American Patent Agency, by F. Lunkenheim, of the Cincinnati (Ohio) Brass Works. For further information address him at that place.

Great Mining Work.

The work of draining the Dubuque lead region, where mining operations have been embarrassed by a copious flow of water, has been commenced on a large scale by a combination of New York and Western capitalists, and promises to take rank among the most notable enterprises of the day. These mines and those in Missouri are the most important in the United States, and among the richest—the former yielding annually from five to ten million pounds of ore. The Northwestern lead region, as it is called, embraces a section of country about sixty miles in diameter, half of which is in Wisconsin and the remainder in Illinois and Iowa. The Dubuque district is confined to a strip varying from seven to ten miles in width. After cutting through the cap rock of the first opening, water here becomes a serious hindrance, so that some of the richest lodes have been abandoned on account of the impossibility of freeing the mines by artificial means. The plan now is to run an adit level or subterranean passage through the solid rock to a neighboring ravine. For the distance of 1,200 feet this tunnel is already complete, and when finished, about eighteen months hence, the entire length will be one mile. Some of the shafts sunk from the surface to the level are 150 feet in depth. The gentlemen concerned in this enterprize expect to lay bare a quantity of mineral of incalculable value. They certainly deserve a rich reward.

THE description of a very rapid process for reproducing pencil drawings has been going the round of the Russian journals. The process will be particularly useful in campaigns, where it is often desirable to have a number of copies of a hasty pencil sketch. Some time ago M. Villani-Villanis remarked, that if a sheet of paper on which a plan or any drawing or writing has been executed with pencil be moistened with acidulated water, and afterward inked, the pencil marks alone will take the ink, and the whole drawing may then be transferred to metal or stone. Captain Sytenko, of the Russian Artillery, director of the photographic service of the staff at St. Petersburg, has introduced very ingenious modifications into this process, and contrived a portable military press, which, as already hinted, may be extremely useful in campaigns. It does not take more than ten minutes to effect the transfer of the drawing upon a zinc plate or lithographic stone.

ZEIODITE.—This substance, says the American *Druggist's Circular*, is made by mixing twenty to thirty parts of roll sulphur with twenty-four parts of powdered glue or pumice, which forms a mass as hard as stone that resists the action of water and the strongest acids. Prof. R. Boettger recommends it for making water-tight and air-tight cells for galvanic batteries.

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VOL. XI. NO. 25....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, DECEMBER 17, 1864.

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WHAT CAN BE DONE FOR INVENTORS.—ADVICE GRATIS AND ADVICE FOR PAY.

For the information of Inventors, we would state that it is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability, without charge. Persons having made what they consider improvements in any branch of machinery, and contemplate securing the same by Letters Patent, are advised to send a sketch or model of it to this office. An examination will be made and an answer returned by early mail. Through our Branch Office, located directly opposite the Patent Office in Washington, we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor most reliable advice as to the probabilities of his obtaining a patent, and also as to the extent of the claim that it is expedient to set up when the papers for an application are prepared. For this special examination at the Patent Office we make a charge of Five Dollars. It is necessary that a model or drawing and a description of the invention should accompany the remittance.

The publishers of this paper have been engaged in procuring patents for the past eighteen years, during which time they have acted as Attorneys for more than TWENTY THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

Pamphlets of instructions as to the best mode of obtaining patents in this and all foreign countries are furnished free on application.

For further particulars as to what can be done for inventors at this office, see advertisement on another page, or address

MUNN & CO.,
No. 37 Park Row, New York.

WHAT CAN BE FOUND IN THE "SCIENTIFIC AMERICAN."

On page 193, Vol. X., can be found an illustration of Root's engine, one of the greatest novelties as well as the most compact form of steam engine ever invented.

On page 24, Vol. X., can be found an illustration and descriptive article on the manufacture of the spirits of turpentine; most valuable information at the present time.

On page 165, Vol. X., and in consecutive numbers can be found a serial article on "The Drill and its Office," replete with illustrations of every known form of the tool in use.

On page 24, Vol. XI., and in numbers following, may be found an article on the Torpedoes used by the rebels, together with illustrations.

On page 244, Vol. X., may be found an article, accompanied by full illustrations, of the manner in which an eight-strand gasket, used by engineers, can be braided.

On page 20, Vol. XI., can be found an illustrated article on "Boring Tools," showing all the styles in general use at the present day.

On page 20, Vol. X., and in subsequent issues of the same volume, can be found the fullest and most complete exposition of the Government ordnance experiments on iron-clad targets ever made public; and in the same volume there are illustrated articles on the Springfield rifled musket, and visits to other factories which show, in the most distinct manner, how the several articles are made.

The information contained in these several articles, taken at random, is of the most general interest and importance, and is peculiar to the SCIENTIFIC AMERICAN. The approaching volume will not in any respect be inferior to those which have preceded it. We hope our readers will use their influence in extending its circulation among their neighbors, as we feel assured that they will be doing both them and us a substantial service.

BOILER EXPLOSIONS NO MYSTERY.

We have repeatedly declared our opinion in the SCIENTIFIC AMERICAN that boiler explosions need not be mysterious. Required a vessel to resist a certain pressure, the engineer proceeds to construct one of the proper size and strength, and if it answer for the first year, it will for twenty years, with a reasonable allowance for the duty done. When a cannon bursts, men say that the charge was too great for it. When a soda-water fountain bursts, they say there was too heavy a pressure from the carbonic acid gas within. When a beer bottle bursts, the same thing is said, but we never analyze the gases to discover the cause, for it is practically settled, from the generation of the force to the moment of disruption, that the vessel was too weak to resist the strain.

A steam boiler, more than any other mechanical structure, is continually liable to accident. It is liable to change of form from constant alternations of heat and cold; from differences of temperature, even when at work; from the shock and impact of the current of steam suddenly checked on its way to the piston; from the variations in that strain; from internal corrosion; from the usual defects in workmanship; from flaws in the material; from carelessness and inattention; from dirt and sediment; from the action of fire on the heated plates; from the expansion and contraction of the hot flues on the cooler shell, and other exigencies not necessary to specify at length. From the hour when the first fire is lighted till the day it is turned out in the street for scrap iron, a boiler wants the closest and most conscientious attention that can be given. Not a week should pass without thorough and rigid inspection of every part that can be got at, even to a hand-hole plate, and the most trivial repairs should be instantly made. If this course were the rule, not the exception, we should have fewer catastrophes. Engineers are apt to be careless about their boilers, but those who take pride in their calling, and realize the power intrusted to them, are invariably vigilant. The various elaborate theories advanced concerning the evolution of gases from water decomposed by hot iron have been disposed of in previous numbers of the SCIENTIFIC AMERICAN, and we may here add, that in nine cases out of ten, but for carelessness, the water could not have got low. Those who are committed to certain theories and speculations about boiler explosions will of course disbelieve and discredit these assertions, but the best evidence of the value of care and attention as preventives of steam boiler explosions is found in marine boilers. The proportion of these that explode is not one in a hundred to twenty-five in a hundred of land boilers.

MAKING MOLASSES FROM CORN.

On page 314 of the current volume we gave publicity to the story, then circulating in the community, that a German chemist had discovered a process for making sirup from Indian corn. At the last meeting of the Farmers' Club, the President, N. C. Ely, Esq., stated that a company had been formed for manufacturing sirup by this process, and that the capital, amounting to $1,000,000 had been all paid up in cash. It will be remembered that we pointed out on page 314, that if the chemist had discovered a process for making cane sugar from corn it was one of the great discoveries of the century, but if he merely converts the starch in the grain to grape sugar he does nothing new.

By a communication to a local paper, we see that Dr. Theodore A. Hoffman, of Beardstown, Ill., assumes that he is the chemist referred to. On May 25, 1858, Dr. Hoffman received a patent for "Improvements in the manufacture of dextrine and sugar," of which the following is the claim:—

"I disclaim the separate action of steam and acids for converting starch, corn, or other grain into dextrin, or sugar, and alcohol therefrom by the usual boiling point of one atmospherical pressure. But I claim the combination of steam and acids for converting starch, corn, or other cereals. into dextrin gum, or sugar, when said grain is subjected to the action of diluted acids, and the temperature of the mass is elevated to 225° or 300° Fahrenheit."

The usual method of converting starch into grape sugar, is by steeping the starch in dilute sulphuric acid at a temperature of 212°, or a few degrees higher. It seems that Dr. Hoffman's improvement consists simply in raising the temperature.

In France and Germany the manufacture of grape sugar from starch is an established industry. The article is employed for adulterating cane sugar, and for manufacturing French brandy. By fermentation it is converted into alcohol, and may therefore be employed in making brandy, or for other operations in which alcohol is required.

We have in the hands of our engraver complete drawings of the apparatus used in France for making sugar or sirup from starch, and shall publish it as soon as it is completed, with full directions for the manufacture. At the present price of sugar the business may be profitable, but purchasers will bear in mind that the sweetening power of this sirup is only about one-third that of ordinary sugar-house sirup which is obtained from cane.

The Buffalo *Commercial Advertiser* says that the chemist alluded to is Frederick W. Goessling, of that city, and that he has discovered the art of converting grape sugar into cane sugar. The *Advertiser* also says:—

"We learn that a company has just been formed, embracing many of the wealthiest men in the city of New York, and among them several of the principal sugar refiners, with a capital of a million of dollars, which has purchased Professor Goessling's patent, paying therefor, to him and his associate proprietors, the sum of six hundred thousand dollars. They propose to enter at once upon the manufacture of sirup and su ar from corn by the new process, upon a large scale, and to introduce its manufacture throughout the country as fast as expedient."

If it be really true that Mr. Goessling has discovered a method of converting grape into cane sugar, he has made a very interesting discovery in chemistry, and if the process is cheap and simple, it is worth the $600,000 which he is said to have received for it.

We have been unable to find that any patent has been issued to Professor W. Goessling on any process for producing molasses from Indlan corn, notwithstanding the Patent Office furnished us with his claims to two patents, which were published in the SCIENTIFIC AMERICAN May 21st, 1864, numbered 42,727 and 42,728. We have sent to Washington for copies of these patents a number of times, but an answer is invariably returned, "No such patent has been granted." Now, we would like to know how the claims came to be officially reported if no such patents were issued. Can the Commissioner enlighten us?

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FESSENDEN ON THE CURRENCY.

In his recent report to Congress Secretary Fessenden says:—"It is observable that, notwithstanding the apparently large circulation of paper money issued under the authority of the various acts of Congress, before enumerated, its scarcity in the market has occasioned no slight embarrassment in the negotiation of loans."

A Secretary of the United States Treasury ought to understand that the facility of negotiating loans does not depend upon the amount of currency in circulation, but upon the surplus capital belonging to the community in all kinds of property. To carry on the war the officers of government must obtain beef, flour, gunpowder, tents and the other commodities requisite for the prosecution of military operations. There are two ways only by which the Government can procure these articles; it can send a sufficiently powerful body of soldiers to seize them by force, or it can persuade the owners to deliver them up by offering something of equal, or slightly greater, value in exchange. The latter is the method adopted by our Government, and during the last four years it has obtained in this way more than two thousand millions of dollars' worth of property. Let us take the case of one of these loans, and see what actually takes place in the transaction.

Mr. D. B. is a gentleman who frequently calls at our office, and who informs us of his operations. He is a retired merchant, and four years ago he employed a portion of his property in discounting commercial paper—in other words, it was invested in the notes of business men. This property was said to be money at interest; but it was not money. The merchants who hired it could not afford to pay interest on it and keep it in the form of money; they wanted it to increase their stocks of merchandise; and it existed in the form of shirtings, flannels, canvas and other kinds of dry goods. In the progress of the war these goods have been sold to the Government, the notes have been paid, and Mr. D. B. has invested the proceeds in Government bonds.

In making these several transactions money has been employed, performing in each case its peculiar office, which is to effect the transfer of commodities. And this is all that money can do. The actual transactions are precisely the same as if they had been done by direct barter without the employment of money—as if the Government had given its bonds to the merchant in payment for the goods, and the merchant had passed these bonds to the capitalist to redeem his notes. While the Government has been hiring two thousand millions of dollars' worth of capital, the whole money in the country has not amounted at any time to one-fourth of this sum.

The power of D. B. to take Government bonds depended wholly upon the amount of capital which he had to invest, and not at all upon the quantity of currency circulating in the community; and this is the case with all other capitalists who subscribe for government bonds. The ability of the people to supply Government with the means for carrying on the war is measured by the quantity of capital which they have to spare in all forms of material wealth, and is not affected in the least by the amount of paper notes which the Secretary of the Treasury chooses to put in circulation.

PROSPERITY OF THE WOOLEN MANUFACTURE.

Hon. Edward Harris, of Woonsocket, R. I., commenced without capital, and has made all his money in the manufacture of woolen cloths. He is now extending his works by the erection of a mill, in which the several floors have an area of more than three acres. This mill is described as follows in the Providence *Journal:*—

"The new mill of Hon. Edward Harris is one of the finest and most massive in the State, and in respect to the solidity of its masonry it certainly surpasses any building erected for manufacturing purposes that we have ever visited. The work of construction is now nearly completed and much of the machinery ready to go in. Hopes are entertained of being able to start about the first of January next. The mill is situated on Mill River and the Air Line Railroad, about half a mile from the Post-office at Woonsocket. The main mill is 224 feet in length and the ell 21, making a total length of 442 feet. The basement and upper story are each fifteen feet hig the three intervening stories thirteen feet high. Connected with the building on the south side of the east tower are the dye house and dry house, each 40 by 100 feet. A short distance from the mill on the west side is a brick building 83 by 50 feet, two stories high with cupola, designed for a packing house and counting room. On the other side is a store house of the same dimensions, for the storage of wool. The boiler house is under the dry house. A Corliss engine of 200 horse-power, to assist the water wheel, is now in and ready to start. The ponderous water wheel is now nearly ready to raise. It is a breast wheel forty feet in diameter, twenty-eight feet in width, and weighs three hundred tuns. The wheel and all its appurtenances are made of oak. Its effect will be equal to three hundred horse-power. The east wing of the mill rests upon a granite arch, the strength and solidity of which there is no figure of speech to describe. It is over the trench which lets the water from the wheel pit. It is twenty-eight feet wide and fifteen feet high from the surface of the water. The length of the trench is seven hundred feet. To furnish water power from Mill River, which is a comparatively small stream, an immense pond two miles long and more than thirty feet deep has been formed artificially, by overflowing portions of several farms. The dam is from three to four hundred feet long, one hundred feet wide at the base and forty feet at the top, and about forty feet in hight. The outlet for the waste water is at what is popularly known as the horse-shoe, which is a semi-circular structure of granite having five regular steps, over which the water flows in a series of picturesque cascades. This structure is very large, costly and beautiful. The water improvements were commenced three years ago.

"The magnitude of the enterprise involved in erecting so large a mill and conducting its subsequent operations has made it expedient to establish work shops on the premises for many varieties of mechanical labor. The planing mill is a very large brick building on the west side of the railroad. It contains first a saw mill, where the lumber of all kinds used in the various buildings has been sawed out from logs. Next is the factory for sash, blinds and doors. Tnen there is the wheelwright shop. These are in the second story. All the doors, sashes and blinds in the mills and all the wheels for the wagons are made on the premises. All the timber and boards are planed in the planing department, which contains three planing machines. There is a grist mill in the same building where the corn is ground for the teams and to supply the help. The establishment contains a Woodruff & Beach engine of forty horse power. The furnaces are fed exclusively with the sawdust and shavings supplied by the saw and planing machines. There is also a brick kiln, connected with the works, on the railroad just north of the main mill. Five hundred thousand bricks were burned there a short time since. There are also on the premises a blacksmith's shop and a paint shop, where the blacksmithing, painting and glazing for the establishment are done. A store 106 by 50 feet and three stories high is in process of erection for groceries, flour and provisions, and for the accommodation of the help.

"The distribution of water about the premises, and the provision made to prevent the ravages of fire, are unusually ample, and devised upon a scale of liberality which cannot fail to make them effectual should emergency arise for their use. The laying of water pipes, six inches in diameter, connecting with those of the corporate village of Woonsocket to the mill, a distance of thirty-five hundred feet, has just been completed. To these pipes are attached eleven powerful pumps in the village. This is in addition to the steam force pumps of the mill. Of course the erection of a large number of tenement houses has been necessary to accommodate the help in so large a mill. There are twenty-five houses, mostly of brick, on the road, fifty tenements nearly or quite completed; also a boarding house, accommodating forty, near the mill, and another in process of erection. The mill yard will be laid out and embellished with a great deal of taste and at much expense. In the construction of the mill, in its every part, and of the lesser buildings, the most careful provisio , nas been made to promote the convenience, comfort and health of the employees."

RAMS.

When the rebel ram *Merrimac* butted the wooden frigate *Congress* and sunk her, two years ago, there was a very general and long continued cry for rams. "Ramming is the thing," said enthusiasts; and for awhile there was little else thought of for offense or defense should an enemy enter this harbor. The case of the North river steamer *Empire*, which some years ago ran into a heavy pier at the foot of 29th street, and went half through it without material injury, was deemed an example of what a ram could do. Some persons argued thus:—"A tallow candle can be shot through a board; *ergo*, a light steamer can cut down a heavier one, no matter how strong, provided she can obtain sufficient speed." Instances were cited: where ships had collided it was shown that the vessel struck was demolished, while the other was unhurt, although the weaker. From these and similar premises it was, and is, argued that of all ships a ram-ship would be the most formidable. Assuming the points taken by the ram advocates to be correct, although they are far from being so, a ship is not a board, neither has it the velocity of a bullet. A solid structure, such as a crib filled in with stone, bears no resemblance nor has it any conditions identical with a ship floating on a yielding medium like water; nor yet can one ship butting another in the ribs, aiming at the adversary's weakest, and striking with its strongest part, be fairly quoted as the invincibility of the assailant and the vulnerability of the assailed. But admitting that they are correct in the main, what does it prove? That rams are essential, that they are reliable, that the action itself is always an efficient one, that a heavy ram may run down a heavier armored ship? Not at all. The results in Mobile Bay and the action in Albemarle Sound both prove that ramming a ship by no means insures its destruction. Even the gallantry of the commanders in these several combats could not overthrow physical forces, or do away with them. The *Sassacus*, a wooden side wheel ship, while moving at the rate of eleven knots, ran at the *Albemarle*, a rebel iron-plated ram, and struck her. She failed, however, to destroy the rebel vessel, although she pushed it before her for a long distance. The *Sassacus* was a light vessel, and ill-fitted for an encounter with such a craft, for in addition to being built of wood, her stem has a rudder in it which of course weakened it very much. In Mobile Bay the results were the same. The *Tennessee* was repeatedly rammed by heavy ships at high speeds, but these attacks were futile and only damaged the assailants.

It will not do to rely solely upon a *possibility* in naval warfare. Success must be assured as far as possible, and victory lies not in rams but in weight of metal; in guns stood up to, and broadsides hurled unceasingly. An unremitting fire from heavy guns in ships, practically invulnerable, will hereafter win the day, and rams, as rams solely, are of little worth. When opportunity serves, the momentum of a heavy body at even a moderate velocity, like a ship, may effect more than a broadside, but the chances for a fair blow in an action between two ships alone are very few, and a skilful seaman can always parry one. We have ships of iron, and guns of iron; we have also hearts of iron to man and manœuvre them, and these will, as heretofore, continue to maintain our national renown upon the sea.

THE NEW SCIENTIFIC SOCIETY.—At the meeting on Tuesday evening, Dec. 6th, the committee on organization reported in favor of organizing under the auspices of the Cooper Union, and it was decided to adopt this arrangement. The name selected by the Trustees of the Cooper Union for the new society is, "The Society of Associates of the Cooper Union for the Advancement of Science and Art." The initiation fee is one dollar, and the annual dues two dollars.

A BOARD of naval officers are examining the *Dunderberg* with a view of making some changes in her casemates. The casemates will probably be lengthened, and the turrets dispensed with, so that she will be a very formidable floating battery. The propeller and shaft will soon be ready to put in their places.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Clothes-washing Machine.—This invention consists in the employment of two sets of swinging plungers, operated by a crank shaft, which have the cranks placed alternately in opposite directions and fitted in oblong vertical slots in the plunger bars, the latter being suspended on a shaft, the bearings of which are at the upper ends of springs, all being arranged in such a manner that the two sets of plungers will, by the turning of the crank shaft, be moved simultaneously in opposite directions, and alternately act against or upon the clothes in the suds-box, and with a pressure due to the springs to which the shaft of the plunger bars is connected. E. McKinley and W. Wilkie, of Mayville, California, are the inventors.

Depthing Tools.—This invention relates to an improvement in that class of tools which are used by watchmakers to determine the correct position or "depth" of the lever in relation to the balance. An ordinary tool of this description is provided with two sets of centers placed side by side; one set to take in the arbor of the balance, and the other to take in the lever staff so that the correct position of the lever, in regard to the balance, can be determined. In such tools one of the centers intended to take in the lever staff passes through the balance and the arms of the latter, by hitting said center, prevent the mechanism from being set in motion until it is taken from the depthing tool and adjusted in the watch, and the final adjustment of the "depth" has to be accomplished with great difficulty and loss of time. These disadvantages are overcome by the improvement which forms the subject of this invention and which consists in the application to one of the centers intended to sustain one end of the lever staff of a U-shaped supporting bar provided with a suitable center to take in the outer or loose end of the lever staff, in such a manner that the entire mechanism, while being supported in the depthing tool can be let in motion precisely in the same manner as if placed in the watch, and the lever can be adjusted to the correct "depth" with care and facility; the invention consists, further, in the combination with the U-shaped supporting bar of an adjustable spring with projections on the ends for the banking pins, in such a manner that the motion of the lever is confined between certain limits and the motion of the lever watch is imitated; the invention consists, finally, in the employment of a movable post or stud attached to one of the centers intended to take in the arbor of the escapement wheel, in such manner that the loose end of the hair-spring can be conveniently held and all the parts of the mechanism adjusted in the depthing tool in precisely the same relation towards each other as in the watch. Artemus Rush, of Fairfield, Iowa, is the inventor.

Side-saddle.—This invention consists in providing the saddle with an adjustable horn arranged and applied in such a manner as to render the saddle capable of being adjusted with the greatest facility to suit either a large or small woman or girl and without the necessity of the rider leaving the saddle, also in the employment of a rest or support for the right foot of the rider; and further, in the use of a support extending along the right side and back of the saddle, terminating in front with a ball or knob to serve as a rein holder, and having the right side of the saddle skirt provided with pockets for the convenience of carrying articles. Clara A. Bartelett, of Ferndale, Cal., is the inventor.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING DECEMBER 6, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

45,306.—Bullet for Small-arms.—E. G. Allen, Boston, Mass.:

I claim the elongated, cylindrical projectile, having a projecting band at or near its center of gravity, as set forth.

45,307.—Magazine fire-arm.—Albert Ball, Worcester, Mass.:

I claim the arrangement and combination of the spring contractor, E, with the barrel and the magazine provided with a spring and follower, as specified.

I also claim the spring contractor made substantially as described.

I also claim the combination of the lever latch, F, or its mechanical equivalent with the magazine, the spring and follower thereof and the spring contractor.

I also claim the combination and arrangement of the tip band, G, with the barrel, the magazine, the lever latch, and the spring contractor, substantially as set forth.

45,308.—Side Saddles.—Clara A. Bartelet, Ferndale, Cal.:

I claim, first, A side saddle provided with horns, arranged and applied substantially as shown, to admit of being adjusted in a longitudinal direction, to vary the size of the saddle to suit the rider, as set forth.

Second, The foot-rest, G, applied to the plate, F, and the latter attached to the saddle, substantially as and for the purpose specified.

Third, The support, D, composed of the rail, e, and standards, g, provided with the knob, E, and applied to the saddle, substantially as and for the purpose set forth.

Fourth, The pockets, I I, applied to the right skirt, H, of a side saddle, substantially as described.

45,309.—Egg-beater or Agitator.—J. W. Bliss, Hartford, Conn. Ante-dated Nov. 25, 1864:

I claim as a new improved article of manufacture, viz., a vessel made of glass, the inside surface of which is provided with protuberances or projections for agitating substances, fluids, etc., substantially as described.

45,310.—Machine for Slicing Cork Wood.—Harris Boardman, Lancaster, Pa.:

I claim the carrying rollers, B, 1, B, 2, when constructed as described in combination with the circular vertical knife blade, A, arranged and operating substantially in the manner and for the purpose specified.

45,311.—Flour Bolts.—Alonzo T. Boon, Galesburg, Ill.:

First, I claim the use of a blast of air of the ordinary temperature of the atmosphere or below it, applied to the exterior of a bolting cloth or similar apparatus, for cooling and drying the flour or other powdered material therein, and for the clearing or cleaning the meshes of the bolting cloth.

Second, I claim the conical pipe, with its lines of orifices and stop-cock, e, as shown in fig. 1, 3 and 4, or the cylindrical pipe with its orifices and diaphragms as shown in figs. 5, 6 and 7, for applying a blast of air in jets to the outer surface of a bolting cloth for cooling and drying the flour or other powder therein, and for cleaning or clearing the meshes of the bolting cloth, substantially as described.

45,312.—Apple-corer and Cutter.—John Bowser, Basil, Ohio:

I claim the tube, B, with the knives fastened thereon, in combination with tube, H, and knives, g g g g, the moving and setting of the disk, A, by means of a screw or otherwise, so that the core is always cut in the center of the apple, also the motion of plug, m, to open and close the hole in disk, A, for tube, B, to pass in for coring small apples, substantially as specified.

45,313.—Railroad Switches.—John F. Brickley, Huntsville, Ind.:

I claim the operating of the "scotch," H, automatically from the switch, C, through the medium of the cross rods, G G, and T-shaped lever, E, connected with the switch, substantially as and for the purpose set forth.

[This invention relates to an improvement on a means employed for throwing automatically by the increment of the switch, an obstruction or "scotch," across the rails of a turn-out to prevent the cars switched off on said turn-out from passing back on the track.]

45,314.—Machine for Cutting the Front Edge of Photographic Albums.—Samuel D. Burlock, Philadelphia, Pa.:

I claim the combination and arrangement of the revolving cutter, Q, with the clamps, B B, and carriage, T, by means of the screw shaft, U, the intermediate shaft, W, and driving shaft, V, the whole being arranged for joint operation, substantially in the manner and for the purpose above set forth,

45,315.—Urinal.—Wm. S. Carr, New York City:

I claim, first, The combination with a basin or water-closet, hopper of the pipe, i, extending below the surface of water, in a receptacle below said basin or hopper, as and for the purposes specified.

Second, I claim the valve, s, actuated by the cam-shaped end of the plug, m, that is moved by swinging the urinal or basin, as set forth.

Third, I claim the cover, k, with raised edges in combination with the pipe, l, for the purposes and as specified.

45,316.—Railway Car.—Thomas Caster, Philadelphia, Pa.:

I claim, first, A dog, F, so constructed and so hung to a railway car, in respect to the wheel that it will operate on obstructions on the right, as set forth.

Second, The combination of the said dog, F, with a bar attached to the axle boxes, substantially as set forth.

Thirdly, The arm, D, dog, F, and bar, C, combined and arranged in respect to a railway car, substantially as specified.

45,317.—Washing Machine.—N. B. Clabaugh, Frederick, Md.:

I claim, first, The rubber and squeezer constructed with openings, d d, between the rubbing and squeezing devices, substantially as and for the purposes set forth.

Second, The combination of a polygonal rotating rubber, B, with a wash-board, C, and slotted bed, f, substantially as described.

45,318.—Casting Stamps and Dies for Crushing Quartz.—George W. Coffee, Aurora, Nevada Ter.:

I claim a stamp for crushing quartz constructed by casting in a chilled mold an outer case or shell of cast-iron around a mandrel or core of chilled cast-iron, substantially as herein described.

45,319.—Cartridge for Revolving Fire-arms.—James M. Cooper, Pittsburgh, Pa.:

First, I claim a metallic cartridge case having a perforated metallic cone (for percussion caps) projecting from its rear end and having no flange or other projection of greater diameter than that of the charge chamber in which the cartridge is to be inserted, and having a neck at or near the rear end of the case to fit a cavity in the chamber, or equivalent construction for holding the cartridge in place, so as to resist the impact of the hammer in firing, substantially as hereinbefore described.

Second, Making metallic cartridge cases with or without a nipple, and having a short neck at the rear end, of less diameter than the main body of the cartridge, fitting closely into a corresponding cavity or perforation at the rear end of the cylinder so as to hold and center the cartridge in the chamber of the breech or cylinder and at the same time sustain the recoil of the cartridge, substantially as described.

45,320.—Weather-strip.—Thomas Cowden, Norristown, Pa.;

I claim the piece, D, with its sockets, d, and the lips, e, forming part of the said socket in combination with the piece, E, its sockets, h, and weights, i, within the said sockets, the whole being constructed and applied to a door and door frame, as set forth.

45,321.—Manufacture of Paper Pulp.—John W. Dixon, Philadelphia, Pa.:

First, I claim the process of manufacturing pulp from wood and from straw, or the equivalent of straw above described, in conjunction by making use of the waste liquor of the wood pulping process to pulp the straw or its equivalent, as above described.

Second, The process of manufacturing two grades of pulp from straw or its equivalent, as above described, in conjunction, by using the waste liquor of the straw pulp or its equivalent first obtained, to manufacture coarse pulp from straw, or its equivalent, for binder's boards, wrapping paper, etc.

Third, The process of pulping wood by caustic soda and then using the residual liquor to treat straw, or its equivalent, and again using the second residual liquor to form an inferior grade of pulp from straw or its equivalent, as above described.

45,322.—Variable Valve Gear.—George and Elihu Dodds, Alleghany, Pa.:

I claim the combination and arrangement of the opening cam, k, and cut-off cam, h, cam yoke, g g, and the spiral cylinder, q, as a cut-off apparatus, constructed substantially as described, with the governor and out of valve of a steam engine, for the purpose of so regulating the closing of the cut-off valve as that the point of cut-off shall change, with the increased or diminished force of steam in proportion to the rapidity of stroke of the engine thus forming a variable cut-off.

45,323.—Machine for Cutting Staves.—Thomas Hanvey, Elma, N. Y.:

I claim the combination of the movable box, B, stationary table, C, cutter, D, and adjustable table, E, for the purposes and substantially as described.

In a machine for cutting staves, substantially as herein described, I claim a spring, J, attached to the movable box, B, so that it will bear against the wood block to be cut and press it against the side of the box or strip, G, therein, to prevent the wood block from sliding sidewise while the process of cutting is going on, substantially as set forth.

45,324.—Horse Hay-fork.—Porter Hill, Millport, N. Y.:

I claim a horse hay-fork the tines of which are connected by a toggle to which the hoisting rope, B, is attached in combination with the rope, C, provided with the hook, D, and the ring, F, on the hoisting rope, all arranged substantially as described.

[This invention consists in the employment of two tines connected by a toggle and having ropes applied to them in such a manner that the tines may be readily inserted in the hay to receive its load and the latter, when the fork is elevated to the desired position, discharged from the fork with the greatest facility.]

45,325.—Cigar Tip Machine.—Wm. W. Huse, Brooklyn, N. Y.:

I claim the combination of two or more disks or rollers whose faces are formed, substantially as specified, to present between them a space of the form of the section of the tip or pointed end of a cigar, and each mounted to turn on an axis at or nearly at right angles with the axis of the cigar, and turning independently of the other or others, to make pressure successively on every portion of the circumference of the tip of a cigar by rolling thereon, substantially as and for the purpose set forth.

45,326.—Machine for making Cigars.—Wm. W. Huse, Brooklyn, N. Y.:

I claim in combination with a series of rotating rollers arranged about a common center substantially as described, the rotating head with pins that enter the bunch of tobacco, substantially as described.

I also claim in combination with a series of rotating rollers arranged about a common center substantially as described, the rolling disks turning on axes at right angles with the axes of the rollers for forming the head of the cigar, substantially as described.

And I also claim in combination with a series of rollers for forming the body of the cigar, and with the disks for forming the head of the cigar, the cutter for cutting the end of the wrapper at the right place for finishing the head of the cigar, substantially as described.

45,327.—Letter and Music File.—Richard B. Irwin, New York City:

I claim combining two or more sharp pins with one leaf or cover of a letter file, in such a manner as that the papers may be pierced thereby at uniform intervals, for the reception of binding cords, to unite said leaves or covers and secure said papers, substantially in the manner herein set forth.

45,328.—Shoal Water Indicator.—Robert M. Knapp, Jerseyville, Ill. Ante-dated Dec. 1, 1864:

I claim, first, The combination of the bar, B, shaft, C, arm, E, connecting rod, F, gearing, H I, and index shaft, J, arranged and operating substantially as shown and described.

Second, The combination of the lever, L, with its catch, O, cord or chain, N, and arm, G, with the bar, B, and shaft, C, whereby the said bar may be stowed compactly away when not in use.

[The object of this invention is to provide an automatic and self indicating sounding apparatus, by which when in operation and within a certain depth of water the sounding or depth may be constantly indicated to the eye of the pilot.]

45,329.—Spring.—Edward Lindner, New York City:

I claim the construction and arrangement of a spring mechanism substantially as described, consisting essentially of a plunger capable of a sliding motion within a vessel containing compressible fluid surrounded by a non-compressible fluid (and whether combined or not with metallic springs), under the arrangement and for operation as herein set forth.

45,330.—Mechanical Motion.—Daniel Lynahan, Buffalo, N. Y.:

I claim the reciprocating bar, B, provided with a series of double inclined planes or their equivalent, in combination with the vertically reciprocating gate, C, working beam or lever, D, and fly-wheel, E, arranged and operating substantially as set forth.

I also claim in combination with the reciprocating bar, B, provided with a series of double inclined planes, the reciprocating shaft or pitman, H, or its equivalent, when said combination has for its object the conversion of a reciprocating into rotary motion independent of the power which operates said shaft, substantially as set forth.

I also claim the balance weight, l, and screw rod, m, in combination with the gate, C, and bar, B, constructed substantially as and for the purposes herein specified.

I also claim the extension of the cross-heads, f f, provided with the adjustable stop rods, r r, in connection with the rock lever, K, and valve rod, t, constructed, arranged, and operating substantially as and for the purposes described.

45,331.—Washing Machine.—E. McKinley & W. Wilkie, Mayville, Wis.:

We claim the combination of the yielding shaft, D, plunger, F, at the lower ends of the bars, E, which are suspended on the shaft, D, the crank-shaft, G, with the cranks, J, fitted in the oblong slots, I, in the bars, E, and the suds-box, A, all arranged to operate substantially as and for the purpose herein set forth.

45,332.—Stocks for Holding Sheep, etc.—Nehemiah Merritt, De Ruyter, N. Y.:

I claim the above described frame or stocks for holding the legs of sheep while shearing or slaughtering, and the legs of calves, pigs, or other animals while doctoring or slaughtering, substantially as described.

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45,333.—Adjustable Sight for Fire-arms.—Charles M. Miles, Vineland, N. J.:

I claim the spring, B, containing the sight notch or opening, f, sliding longitudinally through the base-piece, A, substantially as and for the purpose herein specified.

[This invention consists in forming the sight notch or opening in one end of a spring of thin steel plate which is fitted to slide through a curved slot in the fixed base piece, by which the sight is attached to barrel off the fire-arm, a portion of the said spring being presented above the base in an upright or nearly upright position, and the notch or opening being raised or lowered for different distances by sliding the spring longitudinally through the base piece.]

45,334.—Wrench.—D. M. Moore, Windsor, Vt.:

I claim the combination in a wrench of the ratchet wheel, B, containing the socket for seizing the work with the detents, b b, and lever, g, so constructed as to lock the ratchet against rotation in any direction and also to lock it at will so that the implement may be worked as a right hand or left hand wrench, without removing it from the work, substantially as described.

[This invention consists in the construction of a wrench which may be used either as a right or left hand wrench by a change in the position of two detents which work against a ratchet wheel.]

45,335.—Seed Drill.—Wm. H. Nauman, Dayton, Ohio:

I claim, first, The feeder, A, having flanges, b b, with rings, c c c, projecting towards either flange and leaving a space between the flange and wing on either side, said feeder running over and in combination with an aperture in the bottom of the hopper.

Second, I claim the slide, D, placed next to the hopper bottom in combination with the adjustable slide, E', cut-off, F, and slides, G G, when arranged and operating as and for the purposes set forth.

45,336.—Grain Elevator.—A. B. Nimbs, Buffalo, N. Y.:

I claim, first, The combination of the suspension arms, C, with the grooved jaws, B B, and the elevator leg, A, constructed and operated in the manner and for the purposes substantially as herein set forth.

Second, The extension foot, a2, constructed and operating substantially as and for the purpose set forth.

Third, Controlling the inclination of the jaws, B B, and leg, A, by means of the rack, I, pinion, J, and connecting rod, K, substantially as and for the purpose set forth.

45,337.—Grain Elevator.—A. B. Nimbs, Buffalo, N. Y.:

I claim, first, Suspending the elevator leg in a movable carriage, C C1 C2, by means of which it may be moved outward, horizontally or returned inward, substantially as and for the purposes set forth.

Second, Raising and lowering the elevator leg by means of a rack, E and pinion, E', substantially as described.

Third, Controlling the inclination of the elevator leg by means of the pinion, I, and gear segments, I3, the gear segment being formed on or bolted to the end of one of the jaws, B, substantially as and for the purposes described.

45,338.—Cooking Stove.—Samuel Nowlan, New York City. Ante-dated Nov. 16, 1864:

I claim the apparatus herein described for generating steam, the same consisting of a generator composed of two or more wire gage plates arranged in a chamber as shown, the said chamber being inclosed in a drum of a cooking stove so that the heated gases may surround the same, substantially as and for the purposes set forth.

45,339.—Water Elevator.—Wm. Painter, Afton, Iowa:

I claim the cover, B, placed on the curb, A, as shown, in connection with the latch or fastening, composed of the bar, C, and lips or projections, m m, and connected with the bucket tripping device, J, and the latter connected with the windlass shaft, substantially as and for the purpose herein set forth.

[This invention relates to a new and improved device for elevating water from wells and is designed for domestic or household purposes. The object of the invention is to obtain a water elevator of the kind specified, which will be simple in construction, admit of the bucket being raised and tilted with facility and which will be capable of retaining or holding the bucket at any desired point.]

45,340.—Safety Oil Can.—John M, Perkins & Mark W. House, Cleveland, Ohio:

We claim the can, substantially as described and for the purpose set forth.

45,341.—Machine for Collecting and Amalgamating Gold and Silver.—Eli B. Prater, Washoe County, Nevada Territory:

I claim in combination with the convex shaped bottoms of pan, B, the outlets, C, near the center of the pan for the passage of earthly matter, the rim, x, and the circumferential gutter, g, for the collection of the amalgam when used with or without the inner rim, e, as and for the purposes described.

45,342.—Manufacture of Soap.—J. B. Rand, Fishersville, N. H.:

I claim, first, The combination and saponification of caustic soda, lye and grease fat or oil, by the process and in the proportions stated.

Second, I claim the combination and saponification of caustic, soda, lye, grease, fat or oil and rosin, by the process and in the proportions stated.

Third, I claim the combination of the white clay as herein described with a saponified grease, fat, or oil, as above set forth.

Fourth, I claim the mode of saponifying the white clay with alkali before adding it to the saponified grease, fat, or oil and rosin, as set forth in the specification.

Fifth, I claim the combination of the saponified clay and the saponified grease, fat, or oil and rosin in their saponified condition, as set forth in the specification.

45,343.—Application of Hot Blast to Puddling Furnaces. Jacob Reese, Pittsburg, Pa.:

I claim, first, Creating a hot blast for supplying the fire-chamber of puddling boiling and heating furnaces, by drawing the hot waste air, gases, and smoke, after they have passed over the iron in the puddling chamber from the furnace stack a chimney by means of a fare or similar device and forcing such hot blast, previously recharged with oxygen in the shape of atmospheric air or steam, into and through the fire whereby it is again deprived of its oxygen and receives an accession of caloric, etc., is thus fitted for use in the puddling chamber thus keeping up a constant circulation through the furnace.

Second, The application to the working chamber of puddling, boiling and heating furnaces of a hot blast consisting of the waste heated air, gases and smoke, drawn from the stack or chimney of the furnaces and previously to entering the waking chambers, deoxydized, by a highly heated passage through the body of the fire in the furnace, substantially in the manner hereinbefore described.

Third, Constructing a fan for hot blast with hollow axle arms and wings, or any of them, for preventing the injurious action of the intense heat by passing a current of cold water through the fan, substantially as hereinbefore described.

45,344.—Seeding Machine.—John W. Richards, Newark, N. J.:

I claim, first, The combination with one conductor of two slides, E E', working side by side and two cranks, G G', set at right angles to each other on the axle, I, substantially as and for the purpose herein specified.

Second, The slots or openings, a a, and the brushers, J J, arranged both at the front and at the back of the hopper, so that the slides will receive and deposit the seed both in their backwards and forward movements.

45,345.—Harvester.—G. W. Richardson, Grayville, Ill.:

I claim the combination of the brace rods, H H', and draw-bar, I, when attached or applied to the machine and to the shoe, G, of the finger bar, F, to operate in the manner as and for the purpose herein set forth.

[This invention consists in a novel and improved manner of attaching the finger bar to the main frame of the machine, whereby it is believed several advantages are obtained over other machines in present use.]

45,346.—Horse Rake.—Ira Robbins & James Old, Pittsburg, Pa.:

We claim placing the bar to which the teeth are attached in front of the axle of the machine, and hinging it thereto, so that the weight of the teeth bar and teeth shall bear directly upon the axle and be nearly balanced thereon.

Also in combination with the teeth bar, g, placed in front of the axle as described, the arms, k k, and short arm, l', of the lever, l, attached at one end to the teeth bar in front of and hinged to the axle so that on depressing the teeth bar by a forward motion of the lever, l, the points of the teeth are raised from the ground while the teeth still rest upon the axle, which serves as their fulcrum or turning point, thus dispensing with the use of a separate cross-piece to sustain them in an elevated position, substantially as described.

45,347.—Electro-Magnetic Machines for Ringing Bells.—Charles Robinson, of New York City:

I claim the directing wheel, stop lever and stop wheel, in combination with the armature of an electro-magnet and pin wheel of a striking apparatus, substantially in the manner and for the purposes hereinbefore described.

Also, I claim in combination with the stop mechanism, the regulator of the speed of the machine, substantially as described.

45,348.—Depthing Tools.—Artemus Rush, of Fairfield, Iowa:

I claim, first, The U-shaped bar, g, in combination with the centers, i i* i*, of a depthing tool, constructed and operating in the manner and for the purpose substantially as herein shown and described.

Second, The adjustable spring, n, with the projections or pins, on the ends, to serve in place of the banking pins, and applied in combination with the U-shaped bar, g, substantially as and for the purpose specified.

Third, The adjustable hair spring stud, l, in combination with the center, i, of the depthing tool, constructed and operating in the manner and for the purpose substantially as set forth.

45,349.—Corpse preserving Cases.—Ichabod Searing, of Morristown, N. J.:

First, While not claiming broadly the use of an ice box, constructed and arranged so as to form a refrigerating top for the body chamber, C, I do claim the combination of such box, top or cover, with the body chamber, C, when the whole are so constructed that the air entering the ice box will be conducted down the sides of the body chamber, and allowed to escape through the outer wall thereof, substantially as described.

Second, Providing the double wall chamber, C, or the spaces between the walls thereof, with divisions, c c, and communications with the ice chamber, and also with the external air, substantially as herein described.

45,350.—Combined Grain Drill and Corn Planter.—Thomas Short, of Fairmount, Ill.:

I claim the swivelled furrowing shares, F, and the seeding arrangement, B D E, in combination with the covering roller, G, whose angular projections follow in the track of the follower, the whole arranged substantially as shown and described.

[This invention relates to a machine in which the seed cylinders are so arranged that two alone may be called into requisition for the purpose of dropping corn, or the entire series may be employed for dropping seed. In connection with these cylinders the invention includes a peculiar manner of using shares or runners for making furrows, and a roller for covering the seed after it has been deposited.]

45,351.—Dove-tailing Machines.—Willard G. Sibley, of Weston, Mass.:

I claim the above-described improved dovetailing machine, or arrangement of the mandrel carrying the cutter tools or adjustable supports, the belt tighteners, and the devices for holding them in place, the carriers with their gauges and stops, and the shafts and gear that operate the rising and falling of the stuff-carriers, when constructed and operating substantially as described.

45,352.—Machine for Making Screw Blanks.—Charles W. Smith, of New York City. Ante-dated Feb. 7, 1864:

I claim, first, Forming screw blanks, rivets, nails, pins, and other analogous articles, by means of a series of rotary swedges, arranged with their heads and points alternating, and operating substantially as herein set forth.

Second, Forming the niches in the head of screw blanks, substantially as herein set forth.

45,353.—Making Printers' Type.—John Joseph Charles Smith, of Philadelphia, Pa. Ante-dated Nov. 30, 1864:

I claim the manufacturing of printing type, by forming the bodies thereof out of a strip of rolled metal drawn to a uniform thickness and of the proper width and soldering to one edge of the strip a row of electrotyped type heads, and then cutting the said strip into single type, in the manner substantially as above described.

45,354.—Manifold Writing Book.—A. S. Solomons, of Washington, D. C.:

I claim, first, Combining with one cover of a manifold writing book, a suitable case for containing carbonized paper, substantially in the manner herein set forth.

Second, When a case having a removable sliding top, C, is combined with one cover of a manifold writing book, as is herein described, I also claim lining one side of said sliding top, C, with carbonized paper, in the manner and for the purpose herein set forth.

Third, I also claim the united stylus and lead pencil, D, when combined with a manifold writing book, substantially in the manner and for the purpose herein set forth.

45,355.—Raisin Seeder.—Charles L. Spencer, of Providence, R. I.:

I claim the improved instrument for seeding raisins described, when constructed to operate in the manner substantially as specified.

45,356.—Cartridge Retractor for Magazine Fire-arm.—Edward Stabler, of Montgomery Co., Md.:

I claim, in combination with the retractor, A, the spring, b, substantially as and for the purpose set forth.

45,357.—Ventilator.—E. H. Strong, of Janesville, Wis.:

I claim the combination of a series of tapering curvilinear air tubes of a form nearly corresponding with a flattened cone, with a series of ejecting or injecting surfaces, of which the upper frustrum, B, forms one section of the cone, and terminating a certain proportionate distance inside of the discharge pipe, and cut at their apex, by a plane passing through them at a specific angle with the upper one of a series of ejecting surfaces so arranged and disposed as to prevent spiral currents of air and secure an upward, or, by reversion of parts, a downward current, regardless of the force or angle of impingement of the wind upon it, substantially as shown and described.

45,358.—Bee Hives.—Henry Stump, of Adel, Iowa:

I claim the arrangement and construction of the entrance and connecting passage in the double hive, as described, consisting of the guarded entrances, the connecting passage consisting of a slot, and a series of holes in the adjacent sides respectively, and closed by a slide, together with the auxiliary entrances, f', and the passages, f, from the brood chambers to the honey boxes, the whole forming a means of communication from the outside, and from one part to another, to be used as circumstances require, substantially as described and represented.

[The above is one of the most practically useful hives that we have seen. By its employment the condition and creation of the bees may be observed; they may be separated into new families; swarming may be readily controlled or prevented, and the spare honey may be conveniently removed.]

45,359.—Chuck for Lathe.—Joseph Sutter of New York City. Ante-dated Nov. 23, 1864:

I claim the hub, h, arms, g, and links, f, in combination with the screw, k, and sliding clamps, c, substantially as and for the purposes specified.

45,360.—Pumps for Locomotive Tenders, Etc.—A. W. Sodd, of Chicago, Ill.:

I claim the combination and arrangement of the well, A, cylinders, K, frames, G G G, wedges, M M, hoops, G G G G, pipe, L, valves, O and J, hoop, N, rope and weight, P, rod, Q, transverse bar, H, orifice, V, windless and rope, I, stanchions or posts, D, pulley, C, with ship and unship arrangement pulleys, F F', ropes, T T, hooks, S' S, lever, E, and fulcrum, E, sills, B, substantially upon the principle and in the manner herein set forth.

45,361.—Magazine or Self-loading Fire-arms.—Louis Triplett, of Columbia, Ky.:

I claim, first, Gradually but fully discharging the cartridge case, and gradually returning the retractor to a position for removing another cartridge case, by the means substantially such as described, or the equivalent thereof, during the downward circular movement of the barrel, substantially as set forth.

Second, Retaining the retractor in position for withdrawing another cartridge case, and in position for admitting the full introduction of a loaded cartridge by hand, by the means substantially as described, or the equivalent thereof, during the upward circular movement of the barrel, and at any desired point, substantially as set forth.

Third, In combination with a barrel that is hinged or pivoted to the breech-piece, D, I claim the V-slot, e, straight or return slot, e', switch, f, and cartridge retractor, b, or the equivalents thereof, substantially as described.

Fourth, The application of a latch to the pivot pin, C, and tubular socket, D, for locking the barrel in a position for discharging the load, substantially as described.

Fifth, So constructing the tubular magazine for containing the cartridges, and automatically feeding them into the barrel, that it constitutes the sole stock of the gun, substantially as described.

Sixth, A gun stock constructed with a looped extension beyond the butt, whether the same be made tubular or solid, substantially as and for the purposes described.

45,362.—Paint Composition.—James Trippe, of Orange, N. J.:

I claim, first, The within-described composition for a white pigment, made of ingredients specified and mixed together, substantially as set forth.

Second, Also the use of a deposit of silica and alumina, or white clay, in the manufacture of white paint, substantially as described.

45,363.—Mode of Utilizing the Waste Gas from Petroleum Distilleries.—Herbert W. C. Tweddle, of Pittsburgh, Pa.:

I claim the mode hereinbefore described, of heating the furnaces of stills for distilling petroleum or carbon oil, by means of the permanent gas evolved from the petroleum in the stills during the process of distillation, substantially as and for the purposes hereinbefore described.

45,364.—Chuck.—A. B. Underhill, of Meadville, Pa.:

I claim the formation of the cavity in the hub, to which the circle plate c, is attached, and around the mandrel, for the purpose of using a longer cone than could otherwise be used to move the jaws of a chuck, if there were no such cavity formed in the plate.

I also claim, in combination with the said circle plate, c, made as described, the use of the conical wedge, G, and mandrel, A, for the purpose of operating the jaws of a chuck, substantially as described.

45,365.—Lubricator.—Wm. Van Anden, of Poughkeepsie, N. Y.:

I claim, first, An oil chamber in a crank pin frame, for the purpose as described.

Second, An oil hole or passage running from the chamber, E, to the journal, C, substantially in a manner and for the purpose as described.

Third, The crank pin, in combination with a frame having a chamber for the purpose substantially as described.

45,366.—Window Shutter.—Jossee A. Vrydagh, Cincinnati, Ohio:

I claim, first, The reversely flexible shutter composed of slats, A a a', jointed together by tongue and groove of circular transverse section and connected by secret hinges, in the manner set forth.

Second, A reversely flexible shutter composed of vertical slats, A a a'', jointed and hinged as above and guided in a serpentine or other horizontal path, by rollers, d, bearing wheels, E and V R, and bearing and guiding lateral tracks, I J, substantially as set forth.

Third, The doubly flexible shutter, Figs. 1, 2 and 3, composed of wide vertical slats shod with coved mountings, b b, and having vertical bearing wheels journeled below the body of said mountings and lateral friction rollers, for the purposes set forth.

Fourth, The doubly flexible shutter (Figs. 8 to 14 inclusive), composed of wide vertical slats, of which every third slat is without friction roller and is provided with a large bearing wheel, the whole being arranged and operating substantially as set forth.

Fifth, In the described connection with the reversely flexible shutter I claim the serpentine track, I, Figs. 2 and 11, and the convoluted track, Fig. 10, substantially as described.

Sixth, The serpentine track, I, Fig. 8, occupying a coved party wall, o, and enabling the housing of a reversely flexible shutter so as to afford an entirely unobstructed window or doorway, as herein explained.

Seventh, The hollow pier, Fig. 9, having the two reversely curved tracks, I I, for the housing of as many independent shutters, as represented.

Eighth, Connecting the slats of a reversely flexible shutter by a ligature, V, of a gum webbing or like fabric.

Ninth, The provision of the folding track, I''', adapted and applied to a doorway, in the manner explained.

Tenth, In this connection I claim the removable track, R S T, as herein described.

Eleventh, The mode of screening the lower track by means of the hinged folding sign plate, K, Fig. 12, and carpet strip, K', Fig. 3.

45,367.—Machine for making Carriage Bolts.—J. Theodore Wood and Edward Cone Smith, Pittsburg, Pa.:

We claim the use of feed rolls so grooved as to form the round shank and square shoulder of carriage bolts on the rod continuously, before the blank is severed from the rod, or the head formed thereon, in combination with suitable dies for pressing the shank and shoulder, and severing the bolt from the rod, and a heading tool for forming the head, constructed and arranged substantially as described.

45,368.—Bathing Machine.—Louis Desens, Paris, France. Patented in France Sept. 24, 1862:

I claim an apparatus which, while supporting a person on the surface of the water by means of air-tight balls, cork wood, or any equivalent substance lighter than water, allows the water to freely pass through said apparatus, in the manner above described.

45,369.—Mashing Apparatus.—Charles Maitland, Alloa, Scotland:

I claim an apparatus for mashing, substantially such as herein described, whereby the mash, grain, or grist, in descending to the mash tun, is met by a series of transverse and of vertical jets of water or sparge forced in by liquid pressure or by any other competent power, and by these means the agglomeration of the mash, grist, or grain is effectually prevented, and the mash water or sparge is caused to penetrate each single grain.

[This invention consists in an apparatus for mashing whereby the mash, grain, or grist, in descending to the mash tun, is met by a series of transverse and of vertical jets of water or spurge forced in by liquid pressure or by any other competent power, and by these means the agglomeration of the mash, grist or grain is effectually prevented, and the mash water or spurge is caused to penetrate each single grain.]

45,370.—Manufacture of Magnesium.—Edward Sonstadt, Loughborough, Great Britain. Patented in England Nov. 8, 1862:

I claim the manufacture of the metal magnesium by acting by means of sodium on a material obtained by evaporating to dryness and then heating to redness a mixture in solution of chloride of magnesium with chloride of sodium, substantially as described, and combined therewith the employment of an iron crucible or vessel for conducting the aforesaid process, substantially as described

45,371.—Machine for preparing Cotton and other Fibrous Material.—Cullen Whipple, Providence, R. I. Patented in England July 1, 1863:

I claim, first, The mode of operation by means of which the fibrous material is transferred from each cylinder to the next in succession, such mode of operation consisting in causing the rows of combing teeth to be sheathed below the surface of the cylinder, and thereby be withdrawn from the material at the points and for the length of time in the revolution of the cylinder that will allow the teeth of the next cylinder to take off the sliver, substantially as herein described.

Second, Causing the material to be combed to travel throughout the series of combing cylinders alternately over and under each in a wave line of regular curves for the purpose of drawing out the stock without breaking the fiber, substantially as described.

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45,372.—Spring Tape Measure.—Wm. H. Bangs, Jr. (assignor to Nathaniel L. Bradley and Walter Hubbard), West Meriden, Conn.:

I claim the combination of the case of a spring tape measure with a spring click constructed in such manner that the click is an extension of the spring, substantially as set forth.

I also claim the combination of the case of a spring tape measure with a compound spring click-stock, substantially as set forth.

45,373.—Bottling Still Liquids.—Josiah Beard and Moses Fairbanks, Boston, Mass., assignor to Automatic Bottle-closing Company, New Haven, Conn.:

We claim the method of bottling still liquids, i. e., liquids not charged with gases, or stopping bottles containing such liquids, by the employment in combination with a bottle of suitable form and a ball made of vulcanized india-rubber lighter than the liquid to be bottled, of an instrument substantially as herein described, whereby the ball may be seized in the bottle and brought up into the neck thereof, and which on being withdrawn from the bottle will leave behind the ball, which shall remain tightly wedged in the neck without the aid of internal pressure.

45,374.—Curtain Fixture.—Alonzo Hicks, Factoryville, N. Y., assignor to Lionel Jacobs, New York City:

I claim the crank pin and pendant rod in combination with the curtain roller, substantially as specified.

45,375.—Coal Oil Burner.—John G. Leffingwell, Newark, N. J., assignor to Wilmot & Kissam Manufacturing Company, Brooklyn, N. Y.:

I claim, first, Attaching the upper and lower parts of a burner with one piece of metal for the purpose of forming a hinge or guide, so that the cone or gallery can be turned over, for the purpose described.

Second, I claim forming a hinge as shown in the drawing and marked a, for the purpose described, whether made of one or two pieces of metal, as described.

45,376.—Straw Cutter.—Nelson Lezat (assignor to himself and Egbert M. Palmer), New Baltimore, N. Y.:

I claim the reciprocating two-edged knife, actuated by the cranks in the manner specified in combination with the feeding rollers, h and i, and with the bars or standing shears above and below the opening through which the straw or similar material is protruded, as and for the purposes set forth.

45,377.—Brick Machine.—William H. Paige (assignor to himself and Elisha Child, Jr.), Springfield, Mass.:

I claim, first, The combination of the box, W, having suitable openings in its bottom with the bed, S, presses, D and E, operated by the eccentrics, B and C, or their equivalents, substantially as described.

Second, The combination of the cam, F, arms, l* l*, connections, C and K, pawl, g, ratchet, h, rolls, P P', and band, R, when used in the manner and for the purpose described.

Third, The combination of the cam, F, connection, c, levers, l l' l'', shafts, d d', cams, f f' f'' f''', and bed, S, when used for the purpose described.

45,378.—Soap for cleaning Harness, etc.—James E. Powell, Troy, N. Y., assignor to Samuel C. Glenney and Wm. E. Weeks:

I claim the composition made of the ingredients and in the manner substantially as above described.

[This invention consists in a new and useful composition of matter, the different ingredients of which are hereinafter set forth, by which the inventor produces a new soap for treating and cleaning harness, and all other articles made of leather, and also for taking stains out of cloth, cleaning painted work, removing stains from the coats of horses, and for washing and softening their feet after traveling.]

45 379.—Composition for coating Oil Barrels.—David Ahl, Newville, Pa.:

I claim the composition as herein specified, for the purposes herein set forth.

45,380.—Tobacco Pipe.—L. K. Bowen, Baltimore, Md.:

I claim the new article of manufacture above described, viz., a tobacco pipe, with a cup or receptacle constructed of metal.

45,381.—Time Fuze for Explosive Shells.—Geo. Wright, Washington, D. C.:

I claim making the fuze case annular, and fitting or pressing it into a groove or channel around the charge-hole, and connecting it with the cavity of the shell by an inlet distinct from that through which the bursting charge is introduced, substantially as and for the purpose specified.

I also claim such a construction and arrangement of a fuze and shell as admits of the bursting charge being introduced or withdrawn from the shell of the insertion of the fuze, substantially in the manner and for the purpose set forth.

RE-ISSUES.

1,831.—Device for heating Waxed Threads in Sewing Machines.—Amos Holbrook, Jr., Lynn, Mass. Patented June 21, 1864:

I claim combining with the rotating horn of a sewing machine a conduit for supplying gas to a burner to heat the horn, when so arranged as not to interfere with the free continuous rotation of the horn in either direction, or the supply of gas to the burner.

1,832.—Horse Rake.—Joseph H. Shireman, East Berlin, Pa. Patented Sept. 9, 1862:

I claim, first, Suspending the hand lever, N, upon the axle, B, so that the former may articulate upon the latter, in the manner and for the purpose described.

Second, I claim the inclined way, K, in combination with the hand lever, N, arranged and operating substantially in the manner and for the purpose set forth.

Third, I claim the perforated bar, T, in combination with the hand lever, N, arranged and operating substantially in the manner and for the purpose set forth.

Fourth, The arrangement of the driver's seat to one side of the center of the length of the continuously rotating axle, B, and in relation to the tight driving wheel, A1, lever, N, inclined way, K, and perforated bar, T, in the manner and for the purpose set forth.

Fifth, The arrangement of the hangers, T', of the tooth board, B', on the same rod or shaft that the rake teeth are supported and articulate upon, in combination with an axle which transmits the power of the team to the rake during the act of discharging the hay from the teeth, substantially as and for the purpose set forth.

Sixth, The hangers, T', of the teeth board, B', constructed and applied in connection with a rake which operates to discharge its load by the power of the team through the agency of the axle, substantially as set forth.

DESIGNS.

2,004.—Table Caster.—Michael Moore, Brooklyn, N. Y.

2,005.—Cook's Stove.—Russel Wheeler and Stephen A. Bailey, Utica, N. Y.

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MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON.

Judge Mason was succeeded by that eminent patriot and statesman, Hon. Joseph Holt, whose administration of the Patent Office was so distinguished that, upon the death of Gov. Brown, he was appointed to the office of Postmaster-General of the United States. Soon after entering upon his new duties, in March, 1859, he addressed to us the following very gratifying letter.

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents, while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and I doubt not justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements.

Very respectfully, your obedient servant,

J. HOLT.

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

As an evidence of the confidence reposed in their Agency by inventors throughout the country, Messrs. MUNN & CO. would state that they have acted as agents for more than TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees, at home and abroad. Thousands of inventors for whom they have taken out patents have addressed to them most flattering testimonials for the services rendered them; and the wealth which has inured to the individuals whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! Messrs. MUNN & CO. would state that they never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in their extensive offices, and that they are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5, accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO., corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
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The Patent Laws, enacted by Congress on the 2d of March, 1861, now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject, giving a brief history of the case, inclosing the official letters, &c.

FOREIGN PATTENS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO'S Agency, the requirements of different Government Patent Offices, &c., may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

COPIES OF PATENT CLAIMS.

MESSRS. MUNN & CO., having access to all the patents granted since the rebuilding of the Patent Office, after the fire of 1836, can furnish the claims of any patent granted since that date, for $1.

THE VALIDITY OF PATENTS.

Persons who are about purchasing patent property, or patentees who are about erecting extensive works for manufacturing under their patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing patent, before making large investments. Written opinions on the validity of patents, after careful examination into the facts, can be had for a reasonable remuneration. The price for such services is always settled upon in advance after knowing the nature of the invention and being informed of the points on which an opinion is solicited. For further particulars address MUNN & CO., No. 37 Park Row, New York.

EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents* Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention

Patents may be extended and preliminary advice obtained, by consulting or writing to MUNN & CO., No. 37 Park Row, New York.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

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Notes and Queries

J. R. H., of Ky.—The principal advantages claimed for Baron Von Lenk's gun cotton over gunpowder are, the absence of residue to foul the gun, exemption from permanent injury by moisture, and ease with which the rapidity of burning may be regulated by twisting or braiding the fibers. All of these advantages would be lost by mixing gunpowder with it as you suggest.

S., of R. I.—Simply as purchaser of the right, title and interest of an inventor in an unpatented improvement, you have no right to adopt it as your invention and apply for a patent. Patents are only granted to actual inventors. Under the circumstances you name, the inventor should sign the papers necessary to take out a patent, and assign the whole to you. You can obtain a separate patent for any improvement of your own upon the article.

J. B. G., of Mass.—You will find an excellent engraving of the first monitor iron-clad in No. 12, Vol. VI. (new series) of the SCIENTIFIC AMERICAN.

J. F., of Pa.—Such a gage as you speak of would be very useful. You had better send one of them to us for examination.

C. C., of D. C.—Send your directions to us and we will publish them. Binding of the SCIENTIFIC AMERICAN costs 75 cents per volume.

E. W., of Pa.—We recommend to you "Silliman's Philosophy."

W. J., of Pa.—If you have got too much sulphite of lime in your cider, add more cider.

W. S. N., of Mo.—Messrs. J. E. Tilton & Co., of Boston, have published a complete treatise on phantom flowers.

A. L. D., and others.—Anonymous communications never receive attention.

P. R., of D. C.—It is well known that the cylinder and piston act as a pump when turned the reverse way from that in which the valve is set. Many pumps are made to work on this principle.

J. R. H., of R. I.—The subject of making paper from corn husks has been very fully discussed in the current volume of our paper.

J. D. H., of Pa.—If you should see the quantity of communications that we receive, you would understand that it is impossible for us to preserve them. When we pass upon them they go either to the printer or to the waste basket, and we see them no more.

J. M., of Pa.—Within the scope of human intelligence, all motion is relative. Should a body in uniform motion encounter another body moving with less velocity or in a different direction, it would meet with resistance, and its motion, although uniform, would give it power to overcome a portion of this resistance.

P. H. V., of Pa.—We have no doubt that your statements are correct, but they would not be of interest to our readers.

G. B. C., of N. Y.—We are much obliged for the information you have sent us. It will be made useful hereafter. We have sent you by mail a copy of our pamphlet of advice about patents.

J. N. L., of Conn.—You had better consult some local engineer who can personally examine your machinery, and he can advise you of the power necessary to drive it.

E. G., of Mass.—We are of the opinion that you cannot obtain a patent for your alleged improvements in hydraulic presses. R. Dudgeon of this city, has a patent for a press which combines all the principal features of yours.

A Machinist, of Pa.—Circular motion and revolution are synonymous terms when applied to machinery. A cog-wheel, moving entirely around another cog-wheel inside of it has both a circular motion and performs a revolution.

C. B. L., of Mass.—You will find a good treatise on cutting and laying out gears in Appleton's Dictionary of Mechanics. We never heard of a "gage lathe." Rules for cutting screws can be found in back numbers of this volume.

A Subscriber.—We are constantly securing patents for persons in the army and navy. Employment in the national service does not convey to Government the right to use one's inventions.

J. F. K., Engineer, U. S. Iron-clad.—In making a model of your improved condenser the pumps may be omitted, provided that they are unnecessary to illustrate the nature of your invention.

D. H. W., of N. Y.—Bourne's Catechism on the Steam Engine is the book you require. Also the Practical Draughtsman. Address H. C. Baird, 406 Walnut street, Philadelphia, for both.

A. H., of Iowa.—Address the "Shoe and Leather Reporter," New York, for the information you want.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Nov. 30, 1864, to Wednesday. Dec. 7, 1864:—

W. F. G., of N. Y., $60; M. F. R., of N. Y., $35; J. L. H., of N. Y., $25; F. S., of N. Y., $75; McK. & R., of Pa., $21; H. C., of Maine, $15; W. K. L., of Mass., $25; J. T., of Wis., $16; N. G., of Wis., $15; A. L. B., of Minn., $20; K. & W., of Ohio, $40; J. B. W., of Colorado, $30; W. R. T., of Pa., $25; W. H. & G. W. M., of Conn., $15; B. B., of Pa., $15; R. B. L., of Ohio, $16; M. & F., of Wis., $25; J. L. T., of Maine, $25; G. K., of Vt., $20; E. A. H., of Del., $22; H. & D., of N. Y., $30; M. H., of N. Y., $25; A. M. W., of N. Y., $40; W. T. L., of N. Y., $25; O. H., of Ill., $25; J. B. P., of N. H., $15; J. J. S., of Conn., $25; I. A., of N. Y., $25; O. W. K., of Wis., $16; M. H., of Mass., $25; S. & B., of Mich., $25; O. & J., of I., $16; D. McC., of Ohio, $15; J. C. G., of N. J., $10; T. H. S., of N. Y., $10; S. G. W., of Ill., $15; J. T. R., of Pa., $25; L. S., of Pa., $25; L. W. W., of Mass., $15; E. P. B., of Pa., $15; W. T. K., of Conn., $70; T. M. S., of Tenn., $45; G. H. G., of N. Y., $12; J. M., of N. Y., $25; J. D., of N. Y., $25; A. & B., of Maine, $20; J. N., of Mass., $16; W. F. R., of N. Y., $25; S. W. F., of Mass., $25; E. C., of Maine, $16; R. L. S., of Pa., $30; W. T., of Ill., $25; M. V. C., of Maine, $16; P. & D., of N. Y., $15; F. H., of Ill., $25; T. L., of Conn., $25; M. B., of Ky., $25; L. & S., of Mass., $270; G. L. S., of Wis., $12; A. G. D., of Cal., $15; J. F. A., of Wis., $20; C. D. F., of Cuba, $22; R. E. C., of N. Y., $20; J. P. C., of N. Y., $20; A. & T., of Mo., $45; T. M. T., of N. Y., $22; J. B. P., of Ohio, $25; G. K. G., of Cal., $45; J. O. H., of Ohio, $20; C. H. H., of N. Y., $15; H. L., of N. Y., $45; A. C. M., of Vt., $25; A. L., of N. Y., $20; J. W. N., of Conn., $55; J. A. M., of N. Y., $40; F. C. W., of Conn., $20; D. W. C., of N. J., $25; W. W., of Mass., $20; L. S., of N. Y., $10; E. T. S., of N. Y., $20; W. C., of N. Y., $15; J. H. F., of Ky., $40; C. G. B., of N. Y., $20; H. E., of Pa., $25; B. F. M., of Ill., $20; G. F., of Ill., $20; J. W., of Canada, $40; R. L. S., of N. Y., $20; C. R. M. W., of N. Y., $20; E. C., of N. Y., $15; A. H., of Ill., $20; H. L. E., of N. Y., $65; E. B., of Mass., $10.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Nov. 30, 1864, to Wednesday, Dec. 7, 1864:—

W. F. G., of N. Y.; M. F. R., of N. Y.; J. L. H., of N. Y.; F. S., of N. Y.; T. M. T., of N. Y.; J. W., of Canada; H. L. E., of N. Y.; L. & G., of Pa.; F. H., of Ill.; W. K. L., of Mass.; O. H., of Ill.; M. H., of Mass.; T. H. S., of N. Y.; J. L. T., of Maine; G. L. S., of Mass.; M. H., of N. Y.; A. M. W., of N. Y.; W. T. L., of N. Y.; E. A. H., of Del.; J. B. P., of Ohio; H. L., of N. Y.; J. W. N., of Conn.; T. L., of Conn.; W. R. T., of Pa.; W. F. R., of N. Y.; K. & W., of Ohio, (2 cases); P. & R., of Vt.; C. S., of Germany; L. S., of Pa.; J. T. R., of Pa.; G. H. G., of N. Y.; J. M., of N. Y.; J. D., of N. Y.; J. A. M., of N. Y.; D. W. C., of N. J.; A. C. M., of Vt.; S. W. F., of Mass.; I. A., of N. Y.; J. J. S., of Conn.; W. T., of Ill.; E. S., of N. Y.; A. R., of Pa.; M. & F., of Wis.; H. E., of Pa.

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TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

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The ILLUSTRATED PHRENOLOGICAL JOURNAL for January contains Portraits of Tennyson, Silliman, Sheridan, Cobb, Phillips, the Mother of Wesley, an Indian Chief, Franze Muller, Miss Muggins, Miss Fury, the Princess of Wales, Florence Nightingale, a Group of Warriors, Hannibal Julius Cæsar, Pizarro, Cromwell, Charles XII., Frederick the Great, Winfield Scott, Wellington and Napoleon, with ETHNOLOGY, PHRENOLOGY, PHYSIOLOGY, PHYSIOGNOMY and PSYCHOLOGY. Ready next week. By post 20 cents; $2 a year. Address FOWLER & WELLS, 389 Broadway, New York. 1*

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This volume is devoted to the elucidation of a new Philosophy of Forces, and unfolds the sublimest and most harmonious views of the order of the Universe to which the human mind has yet attained. The authors are among the ablest men of Science in Europe, and their names are a supreme guarantee of the interest and authoritativeness of the work. The founders of the new doctrines are in this case also its expositors, and the book combines in an unparalleled degree the philosophy of the original discoverer with thorough simplicity and popularity of statement. Dr. Faraday says that the conservation of force is the highest law in physical science which our faculties permit us to perceive. Herbert Spencer says it is the highest law of all science. Prof. Tyndall says that these discussions open a region which promises possessions richer than any hitherto granted to the intellect of man. No one who cares to understand the great tendencies of modern thought and the majestic advance of science into new regions, can afford to be without this work.
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FOR SALE.—3 NEW 8-FOOT ENGINE LATHES, screw cutting, weight 1,600 lbs., $450; two second-hand 12-foot ditto, no screw, swing 21 and 24-inch diameter, $450. Address J. A. FAY & CO., or E. C. TAINTER, Succeeding Partner, Worcester, Mass. 25 tf

FOR SALE.—ONE MULEY SAW MILL, WITH 20 foot carriage and 7-foot saw, $600; one Re-saw Machine, 4 rolls, 5-foot saw, $400; one Axe Handle and Spoke Lathe, $225. Address J. A. FAY & CO., Worcester, Mass., or E. C. TAINTER, Succeeding Partner. 25 t

ANDREWS' PATENT OSCILLATING ENGINES ARE compact, strong, light, durable, simple and economical. We make them double and single of twenty sizes, from one-half to 250 horse-power. They leave the shop set up ready for use and require no foundation. For particulars and prices (which are low) address WM. D. ANDREWS & BRO., 414 Water street, New York. 8*

WANTED.—A PARTNER, EITHER ACTIVE OR silent, with a cash capital of about $20,000, to take the place of a retiring partner in a large and profitable Agricultural Implement Manufactory. Address, with real name, K. S., Box 241, Baltimore Post office. 24 5*

FOR SALE.—THE ENTIRE RIGHT FOR THE United States of my Oil Stone Fountain, illustrated in No. 24, Vol XI. of the SCIENTIFIC AMERICAN, is for sale, For further information address JAMES FUNK, Beverly, Adams county, Ill. 24 2*

BLAST MACHINERY FOR SALE.—TWO VERTICAL Blowing Cylinders, 40 inches diameter, 36 inches stroke, in fair order. Apply to MERRICK & SONS, Philadelphia. 24 tf

LEATHER BELTING FOR SALE.—ONE SECOND-hand 20-inch double belt, 75 feet long; also one 16-inch double belt, 83 feet long; also one 12-inch double belt, 30 feet long. Also three Steam Engine Governors, will be sold cheap. Apply at the Metropolitan Flour Mills, No. 267 Cherry street, New York. 24 3*

AMES'S IRON WORKS, OSWEGO, N. Y.—WE ARE now manufacturing a superior article of eight and twelve horse-power Portable Engines. Also Pays's Patent Forge Hammer, the best forge hammer now in use for all forgings under six inches. 24 3* H. M. AMES & CO.

BATTERY PLATINA—BEST FRENCH—FOR SALE by SAMUEL S. WHITE, 658 Broadway New York. 24 2*

PORTER'S FOOT-REST AND BLACKING-BOX.—Illustrated in Vol. XI., No. 21 (new series). Rights for sale Address JOHN H. PORTER, 415 Hudson street, New York. 24 3*

MALT VINEGAR.—A PURE AND TRANSPARENT article, produced in a short time from different kinds of grain, with a perfect malting process, etc. No malt house required. Pamphlet sent by mail with full particulars. Price $10. Address R., Box 189, Brooklyn, N. Y. 24 4*

PLANER CENTERS THAT WILL SWING 12, 18, and 24 inches, for sale by THOMAS & CO., Worcester, Mass 2

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FREIGHT CONDUCTORS AND BRAKEMEN WANTED.—The BALTIMORE & OHIO RAILROAD COMPANY want a number of experienced RAILROAD MEN to run upon its numerous freight trains, on its five several divisions between Baltimore and Wheeling and Parkersburg. The best wages will be paid and regular employment given to such men as will report to either of the following agents, who are authorized to take them on duty:—

A. J. FAIRBANK, Agent First Division, Mount Clara Station, Baltimore City, Md.

D. DARBY, Agent Second Division, Martinsburg, one hundred miles from Baltimore.

J. F. WALL, Agent Third Division, Piedmont.

W. CARR, Agent at Grafton for the Parkersburg Road; and

J. B. FORD, Agent at Wheeling for the Fourth Division.

W. P. SMITH, Master of Transportation.

Baltimore, Md., Dec. 8 1864. 25 4

ARMY SUPPLIES.

OFFICE OF ARMY CLOTHING AND EQUIPAGE,
No. 502 Broadway, New York, Dec. 8th, 1864.

SEALED PROPOSALS WILL BE RECEIVED AT this office until 12 o'clock M., on Monday the 12th instant, for baling Army Blankets, until the 1st of May next, the Contractor to furnish all materials necessary to bale the blankets in a satisfactory manner to this department. The services to be performed in the buildings of this Depot, the Contractor to supply the machinery.

Further information can be obtained at this office. Bidders will state the number of bales they can put up per week, and send with their proposals a proper guarantee signed by two responsible persons, stating that if a contract is awarded to the bidder, they will enter into bonds for the faithful performance of the work.

The United States reserves the right to reject all bids deemed objectionable.

Proposals should be endorsed "Proposals for Baling Blankets," and addressed to

1 COL. D. H. VINTON, D. Q. M. Gen. U.S.A.

FOR THE HOLIDAYS AND WINTER EVENINGS.

Innocent Moral Fireside Games have become a necessity in every family.

In selecting for this season every person should examine the NEW ENGLAND GAMES, published by

MILTON BRADLEY & CO.,
Springfield, Mass.

These are acknowledged to be the best in the market, and comprise among others The Checkered Game of Life, Modern Hieroglyphics, Patriot Heroes, What is it, including author's improved, Russian Dominoes, Contraband Gymnast, Puzzles, etc.

Don't buy trash when a really good thing can be had as cheap.

24 3

GAMES FOR THE SOLDIERS OR FAMILY CIRCLE.

Nine Fireside Games, including The Checkered Game of Life, Backgammon, Checkers, Chess, Russian Dominoes, and four other games of Dominoes.

All put up in a small box weighing but five ounces. Just the thing to send to the boys in CAMP or HOSPITAL for a CHRISTMAS PRESENT, or to keep at home for the winter evenings.

Sent by mail, postpaid, to any address for $1, by

MILTON BRADLEY & CO., Publishers,
24 2 Springfield, Mass.

BUTLER'S DUTCH GAP CANAL! THIS WORK IS nearly completed, and persons in the North who wish to keep a memento of the Rebellion will be supplied with specimens of the peculiar geological formations there discovered. Enclose one dollar and address A. R. MCNASSY, 3d Brigade, 2d Division, 18th Army Corps, near Dutch Gap, Va. 24 4*

STEAM ENGINES.—FOR SALE A DOUBLE OSCILLATOR (new), cylinders 8-inch diameter by 10-inch stroke, Address H. H. R., Box 773, New York Post-office. 24 4

WANTED. — A LATHE-CUTTING OR SAWING Machine. Address GEO ELBREG, Post-office Box 586, Indianapolis, Ind. 24 2*

GRIST MILL AND WATER POWER FOR SALE.—Situated on the New York and Philadelphia Railroad, eight miles from Camden, with a never failing supply of water for mill, and a large amount of machinery. Address C. B. ROGERS, No. 133 Market street, Philadelphia. 24 2*

WANTED.—TWO YOUNG MEN (BROTHERS), with a number of years' experience in the Hardware trade in this city, of first-class business ability, and unquestioned character, with $10,000 at their command, are desirous of finding some patent article in their line of trade, the introduction and sale of which would occupy their entire time and energy to advantage. None but good and useful articles of real merit will be considered. Address H. A. P., Box 5,409, New York City Post-office. 24 13

THE OUNCE BOOT-DRAWER AND PANTALOONS GUARD.—This article, recently illustrated in this paper, is having a rapid sale, and is pronounced by every one to be a complete thing. Yankee notion dealers, sutlers, shoemakers and dealers in military trimmings, also general hardware stores and country merchants can make large profits and find a ready sale for this article. They are in japanned iron and will fit any boot: easily attached in two minutes, and really the neatest thing for a small article ever seen. One pair sent free by mail for 40 cents. I will send one dozen pair by express for $2 40, charges *not* paid; one gross for $24; half gross for $13.

N. B.—Parties ordering in this way will please send the exact price, not 20 or 30 cents, and say they have no more change. Do business in a business manner. Money orders on the Post-office received. EGBERT P. WATSON, Box 773, New York Post-office.

150 HORSE STEAM ENGINE, 26-INCH CYLINDER, 5 foot stroke, 28 foot fly wheel, with three 42-inch boilers, 30 feet long. All new and complete for running. Address CHARLES H. SMITH, 135 North 4th street, Philadelphia. 24 3*

MACHINERY.—ONE 16-FOOT LATHE, 60-INCH swing; Slide Lathes, 4, 6, 8, 12 and 18 feet bed; Iron Planers, 3, 5, 7 and 9 feet; Bolt Cutters; Upright Drills; Compound Planers; Universal Chucks, etc., etc., on hand, at Machinery Depot, 135 North 3d street, Philadelphia. CHARLES H. SMITH. 24 6*

WANTED.—$125 A MONTH! AGENTS EVERYwhere, to introduce the new Shaw & Clark $16 Family Sewing Machine, the only low price machine in the country which is licensed by Grover & Baker, Wheeler & Wilson, Howe, Singer & Co., and Bachelder. Salary and expenses, or large commissions allowed. All other Machines now sold for less than forty dollars each are infringements, and the seller and user liable. Illustrated circulars sent free. Address

23 12* SHAW & CLARK, Biddeford, Maine.

GALVANIZED IRON.—GALVANIZING DONE WITH despatch and castings furnished if desired, either Malleable or Gray Iron. Address WILCOX & HALL, Middletown, Conn. 23 26 eow*

FOR SALE.—ONE 12-HORSE HORIZONTAL STEAM Engine. Also one large Engine Lathe, 6 feet swing. Address P. O. Box 781, Albany, N. Y. 23 3*

WANTED.—A PORTABLE STEAM ENGINE AND Saw Mill of 12 or more horse-power. Address, with terms, A. LEIZE & CO., Reading, Pa. 23 4*

WAIT'S IMPROVED JONVAL TURBINE WATER Wheel is the most powerful, durable and economical wheel ever offered to the public. Every one who contemplates putting in a new wheel to drive any kind of machinery should become acquainted with these wheels before purchasing any other. Circulars sent on application. Address P. H. WAIT, Hydraulic Engineer, Sandy Hill, N. Y. 24 3*

PLATINA.—WHOLESALE AND RETAIL, FOR ALL purposes. H. M. RAYNOR, Importer, 748 Broadway, N. Y. 24 4*

ARMY SUPPLIES.

CLOTHING BUREAU, QR. M. GENL'S OFFICE,
Washington, Dec. 8th, 1864.

SEALED PROPOSALS WILL BE RECEIVED AT the respective offices of Army Clothing and Equipage in New York City and Philadelphia, until 12 o'clock M. on Wednesday, the 21st inst., for furnishing by contract at the Depot of Army Clothing and Equipage in either City, at the option of the Contractor, 200 000 Army Blankets, wool, gray (with the letters U. S. in black, 4 inches long, in the center), to be seven feet long and five feet six inches wide, to weigh five pounds each.

Proposals will be received for the delivery of Blankets of either American or English manufacture, but must be in all respects equal to the army standard at the respective Depots where they are to be delivered.

Bidders will state the number they wish to furnish, how soon they can commence, and the number they can deliver monthly.

Proposals must be accompanied by a proper guarantee, signed by at least two responsible parties, setting forth that if a contract is awarded to the party making the bid, that he or they will at once execute the contract and give bonds for the faithful performance of the same.

The United States reserves the right to reject all bids deemed objectionable.

Proposals should be endorsed "Proposals for furnishing Blankets," and those for New York should be addressed to Brig. Gen. D. H. Vinton, Dy. Qr. Mr. General, New York City; and those for Philadelphia should be addressed to Col. Herman Briggs, Qr. Mr. Department, Philadelphia. 1

MACHINISTS WHO ARE DESIROUS OF IMPROVING their condition in life by entering the United States Navy as Engineers, at $1,108 per year, can do so without failure. Address, with two stamps, J. HARRIS, 355 North 10th street, Philadelphia, Pa. 23 5*

FOR SALE.—FOUR VALUABLE PATENT RIGHTS. The inventor has realized over twelve thousand dollars out of one of them in the last twelve months. For particulars address MACFERREN & LASH, 721 Chestnut street, Philadelphia. 23 5*

THE PATENT OUNCE BOOT JACK.—SEND FOR my circular. EGBERT P. WATSON, Box 773, New York P. O.

FOR GRAY & WOOD'S, WOODWORTH & DANIEL'S Planers, address J. A. FAY & CO., or E. C. TAINTER, Succeeding Partner, Worcester, Mass. 9 a*

WOODWORTH PLANERS—IRON FRAMES TO Plane 18 to 24 inches wide, at $120 to $150. For sale by S. C HILL. No. 12 Platt street, New York. a

HOLSKE & KNEELAND, MODEL MAKERS. PATENT Office Models, Working Models, and Experimental Machinery, made to order at 528 Water street, near Jefferson street, New York. Refer to Munn & Co., SCIENTIFIC AMERICAN Office. 1tf

SOLID EMERY WHEELS, SILICATE OR VULCANITE, of every size, promptly made or shipped from stock. N Y. EMERY WHEEL CO., 94 Beekman street, New York. 24 2*

MUSICAL BOXES, PLAYING FROM 1 TO 24 tunes, costing from $3 50 to $750. Every variety of the newest accompaniments: VOIX CELESTES (Celestial Voices), ORGANOCLEIDES, MANDOLINES, EXPRESSIVES, PICOLO, BELLS, DRUMS, CASTINETS, etc., etc. Musical Boxes are very durable, and are exceedingly desirable for HOLIDAY PRESENTS. They are fine ornaments for the parlor, as well as pleasant companions for the invalid. Having given my special attention to that trade for over 15 years, I am able to supply any want quicker and better than any house in this country. M. J. PAILLARD, Importer, No. 21 Maiden Lane (up stairs), New York. Musical Boxes repaired. 23 5

SPOKE MACHINES, OF AN IMPROVED PATTERN, made by J. GLEASON, No. 1,030 Germantown avenue, Philadelphia, Pa. 23 6*

FOR SALE.—REED & PACKARD'S SPRING CATCH Button. A new and valuable invention for fastening side and back curtains to carriages. Illustrated in No. 17, current volume of the SCIENTIFIC AMERICAN. Price and sample sent by addressing REED & PACKARD, North Bridgewater, Mass. 23 4*

PATENT RIGHTS FOR SALE.—CONSISTING OF Mining Machinery—Steam Boiler, Forging heavy guns, shafting and turrets—with others of less note. A. HITCHCOCK, Patentee, No 4 and 6 Pine street, New York, Room 21. 23 4*

$950—FOR SALE A COMPLETE AND MOST perfect Trip Hammer, on Hughes's Patent Atmospheric principle, worth $950, and will be sold for $500. It is made entirely of wrought and cast iron, occupies very little room, strikes light and heavy blows, at the will of the operator, and runs by belt. Inquire of D. A. MORRIS, Rockaway, N. J. 23 3*

FOR SALE.—ONE FLUE BOILER, 30 FEET LONG by 45 inches diameter, with two 14-inch return flues, including boiler front, bonnet, pipes, valves, etc., all complete; has been in use about five years, and is in good condition. Please address Plant s Manufacturing Company, New Haven, Conn. 21 tf

INVENTORS IN WANT OF CASH CAPITAL TO introduce their inventions can hear of a party who will furnish any reasonable amount, by addressing W. B. G., Box 5,722, New York.

N. B.—None need apply unless having really useful articles. Give description. 21 12*

DIAMOND PARLOR MATCHES.

These Matches are the BEST IN THE WORLD, SURE FIRE, WITHOUT SULPHUR, no disagreeable smell, and a luxury and comfort to smokers and people with weak lungs. For sale, wholesale and retail, by

THE LODI MANUFACTURING COMPANY,
22 4 No. 66 Cortlandt street, New York.

FOR THE HOLIDAYS.

No more useful or acceptable present for the Holidays can be found by Parents or Guardians than one of

PARR'S TOOL CHESTS,

Containing complete setts of tools ready for use. Prices from $2 up, and containing from 8 to 128 different articles, according to size, and adapted to the use of Boys, Youths, Amateurs, and Farmers.

PARR'S HORTICULTURAL CHESTS are also an admirable and useful gift for Ladies, as well as Boys and Girls. They stimulate a taste for Gardening, and thereby ensure healthy open air exercise.

PARR'S TURNING LATHES FOR AMATEURS, with tools to correspond, are an excellent device for the home amusement and instruction of young and old.

To be obtained from the Manufacturer, or through all respectable Hardware and Variety Dealers, whose attention is respectfully called to the greatly increased call for these goods.

Send for illustrated circular to GEORGE PARR, Manufacturer, Buffalo, N. Y. 19 tf

TWIST DRILLS.—ALL SIZES OF STUB'S WIRE Drills; also Twist Drills for machinists' use, varying in diameter by 32nds from 3/8 inch to 1¼-inch, together with sockets to fit them. For sale by the "Manhattan Fire Arms Company, corner of High and Orange streets, Newark, N. J. 20 8*

10, 15, 20, 30, 50, 80, 100, 150 HORSE-POWER Engines for sale, with or without boilers, a nest of six boilers, 80 horse each. One or the lot for sale cheap. All complete with attachments. Call or address DAVIS, Machinery Yard, 17 and 19 Morris street, Jersey City. 24 2*

A VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them——Importance of the Specification—Who are entitled to Patents—What will prevent the granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of he PATENT LAW and PRACTICE, but to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

Address MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, No. 37 Park Row New York.

IRON PLANERS, ENGINE LATHES, DRILLS AND other machinists' tools, of superior quality, on hand and finishing, for sale low. For description and price address NEW HAVEN MANUFACTURING COMPANY, New Haven, Conn. 1tf

OIL! OIL! OIL!

For Railroads, Steamers, and for machinery and Burning, EASE'S Improved Engine and Signal Oil, indorsed and recommended by the highest authority in the United States. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The "Scientific American," after several tests, pronounces it "superior to any other they have used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE, No. 61 Main street, Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the United States and Canada. 5 tf

PORTABLE STEAM ENGINES—COMBINING THE maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 300 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO Lawrence, Mass. 9 tf

CAVALRY HORSES WANTED

CAVALRY BUREAU, OFFICE OF ASSIST. QUARTERMASTER,
No. 18 State street, New York, June 10, 1864.

I WILL PURCHASE IN OPEN MARKET ALL THE Calvary Horses that may be presented and pass inspection at the Government Stables, corner of 10th avenue and 35th street, in this city, until further notice.

Payment will be made in checks payable in certificates of indebtedness, when seven (7) or more horses are received. Price, one hundred and sixty dollars each.

6 tf GEO. A. BROWNING, Capt. and Assist. Qr. Mr

ENGINEERING, CIVIL AND MILITARY; CHEMISTRY, Metallurgy, Assaying, &c., at Union College, Schenectady N Y. For Circular address Registrar. 24 1y*

REYNOLDS' TURBINE WATER 'WHEELS.—COMPETENT men are employed to measure streams, make plans, and put in flumes, wheels, and gearing. TALLCOT & UNDERHILL, No. 170 Broadway, New York. 16tf

BAILEY'S PATENT ICE CREEPER.—CREEPERS or Patent Right for sale. See illustration, page 192, Vol. VIII., new series, SCIENTIFIC AMERICAN. GILBERT L. BAILEY, Portland, Maine. 23 5eow*

BRASS PINION WIRE FOR GAS AND WATER-meter Makers, made by PETER COLLIE, Clock-maker, 1,176 South 11th street, Philadelphia, Pa. 21 5*

SAVING OF FUEL TO PARTIES USING STEAM—DAMPER REGULATORS

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms of flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 5 Park Place, New York. 3 26*

$70 A MONTH! I WANT AGENTS EVERYWHERE, at $70 a month, expenses paid, to sell Fifteen Articles, the best selling ever offered. Full particulars free. Address OTIS T. GAREY, Biddeford, Maine. 22 13*

GROVER & BAKER'S HIGHEST PREMIUM ELASTIC Stitch Sewing Machines, 495 Broadway, New York. 1

GUN AND PISTOL SCREWS.—COMSTOCK, LYON & CO., Manufacturers (Office, 74 Beekman street, New York), are always prepared to furnish Gun and Pistol Screws to sample. Screws to fit the U. S. Musket, Sewing Machine Screws, and Metal Screws generally, of the best quality, at short notice. 16 26

PECK'S PATENT DROP PRESS MANUFACTURED in all its varieties, by M. & C. PECK & CO., Founders and Machinists, New Haven, Conn. 16 26*

WROUGHT IRON PIPE, LAP WELDED BOILER Flues, Brass Cocks, Stop Valves, Water Gages, Steam Whistles, Gas and Steam Fitters' Tools, Steam Boilers, Steam Pumps, Feed Pumps, Galvanized Iron Pipe for water, etc., etc. JAMES O. MORSE & GILLIS, 76 John street and 29, 31, and 33 Platt street, New York. 16 12*

NOTICE.

Steels or Irons for all kinds, Farming Machines forged or worked into any shape desired, and finished in any style required. All communications promptly answered. Address D. B ROGERS & SONS, Pittsburgh, Pa. 16 10*

NERVOUS DISEASES AND PHYSICAL DEBILITY arising from Specific causes in both sexes—new and reliable treatment, in Reports of the Howard Association—sent in sealed letter envelopes, free of charge. Address Dr. J. SKILLIN HOUGHTON, Howard Association, No. 2 South Ninth street, Philadelphia, Pa. 14 12*

BEST QUALITY OF

MALLEABLE IRON CASTINGS

Furnished to order and at short notice by addressing "Malleable Iron Works," New Britain, Conn. 13 13*

BELKNAP & BURNHAM, MANUFACTURERS OF Globe and Check Valves, also Steam and Gas Cocks, Bridgeport, Conn. 20 8*

TO INVENTORS OF ANY IMPLEMENTS FOR FARMER'S use, requiring the use of iron or steel, an opportunity may be found to dispose of or develope the same, by addressing, with description, Box 532, Pittsburgh, Pa. 16 10*

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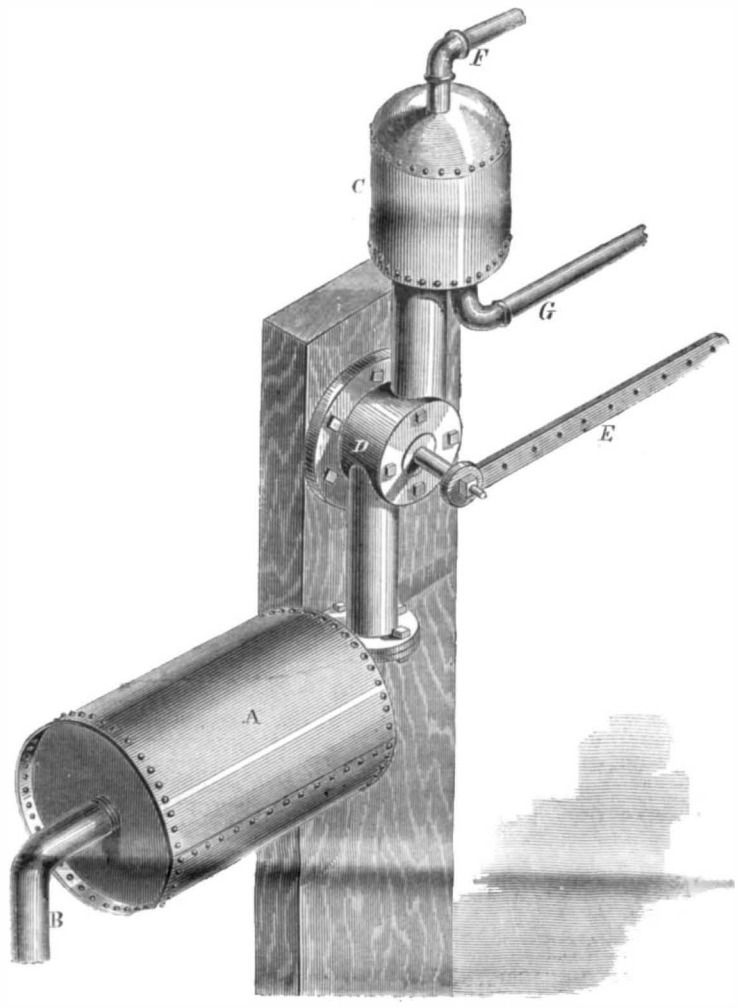
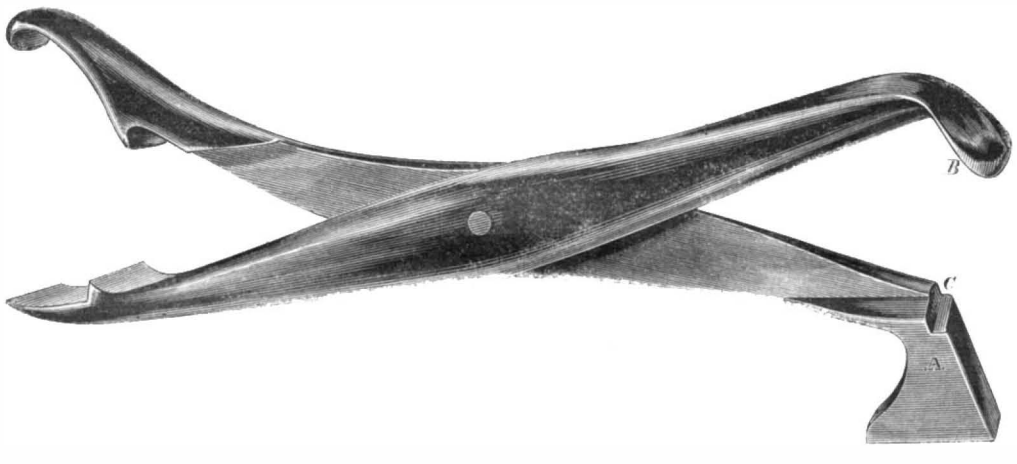
Improved Apparatus for Oil Wells.

The object of this invention is to augment the flow of petroleum in sluggish wells; also to collect and save the gas arising from the oil, so that it can be used for illumination or fuel. To effect these objects the receiver, A, is provided, having a pipe, B, leading into it from the well. Between the receiver and the gasometer, C, there is a double acting lift and force pump, D, placed, which is worked by the brake, E, either by hand, or power. When this pump is operated, the air in the receiver, A, is exhausted,



HOBBS'S APPARATUS FOR OIL WELLS.

which causes the oil to flow readily into it. From the receiver the oil is pumped into the gasometer, C, in the upper part of which is a pipe, F, to carry the gas to any desired point; there is also another pipe, G, through which the oil enters tanks or barrels placed beneath it. As the gas passes through water



REYNOLDS' STOVE HOOK.

it is rendered perfectly safe to use. This apparatus therefore saves all the oil and increases its flow by the pressure of one atmosphere. It was patented Sept. 27, 1864, by Isaac H. Hobbs, of Philadelphia, Pa.; of whom all further information can be had.

Improved Stove Hook.

Few persons would imagine that a common piece of cast iron could be made into such form, or be applicable to so many different uses, as the one represented in this engraving. The ordinary stove lifter has been the subject of many patents, which have returned money to the inventors of them. This fact shows that there is nothing in daily use so small, or so insignificant, that it cannot be made to yield a good profit to the person who shall improve upon it so as to increase its utility.

The hook here shown, which the inventor styles a "Dexter," can be used for lifting pans from the oven, for raising the covers to stoves or ranges, to replenish the fire, and for other purposes that stove hooks are applied to. In addition, there is a hammer head, A, which is exceedingly convenient for driving nails, putting down carpets, etc. When closed, the jaw, B, forms a pair of pincers with the back of the hammer, so that the hem of a carpet can be caught and stretched by it, and the little notch, C, lets the wired edge of a tin pan in so that the body is firmly caught. The other end of this stove hook can be used for lifting hot sad irons; in fact anything that cannot be touched by the hand. There is a spring inside between the two parts of this utensil which keeps the jaws open, ready for use, as shown in the engraving. This is a very convenient article, and will doubtless be popular with all housekeepers.

A patent is ordered to issue on it through the Scientific American Patent Agency, by Edwards Reynolds, of Corunna, Mich. For further information address him at that place.

CAPTURE OF MORE BLOCKADE RUNNERS.—The blockade runner *Vixen*, a new English vessel built especially for speed, was recently caught by the *Rhode Island*, a large ocean steamer. It is stated that the *Vixen's* wheels revolved with such velocity that all the buckets were thrown off. We do not hear that the *Rhode Island* threw off any. The *Armstrong* was also recently captured by the *Gettysburg*. The blockade runners are all fine new vessels, but are no match whatever for our own steamers in speed.

THE plow makers of the Northwest had a convention at Chicago last week, at which it was resolved to advance the price of plows twenty per cent.

TO

INVENTORS, MECHANICS, AGRICULTURALISTS.

THE ANNUAL

PROSPECTUS

OF THE

Scientific American,

THE CHEAPEST AND BEST

MECHANICAL JOURNAL IN THE WORLD,

A NEW VOLUME OF WHICH COMMENCES

JANUARY 1, 1865.

This valuable journal has been published nineteen years, and during all that time it has been the firm and steady advocate of the interests of the Inventor, Mechanic, Manufacturer and Farmer, and the faithful chronicler of the

PROGRESS OF ART, SCIENCE AND INDUSTRY.

The SCIENTIFIC AMERICAN is the largest, the only reliable, and most widely-circulated journal of the kind now published in the United States. It has witnessed the beginning and growth of nearly all the great inventions and discoveries of the day, most of which have been illustrated and described in its columns. It also contains a WEEKLY OFFICIAL LIST OF ALL THE PATENT CLAIMS, a feature of great value to all Inventors and Patentees. In the

MECHANICAL DEPARTMENT

a full account of all improvements in machinery will be given. Also, practical articles upon the various Tools used in Workshops and Manufactories.

STEAM AND MECHANICAL ENGINEERING

will continue to receive careful attention, and all experiments and practical results will be fully recorded.

WOOLEN, COTTON AND OTHER MANUFACTURING INTERESTS

will have special attention. Also, Fire-arms, War Implements, Ordnance, War Vessels, Railway Machinery, Mechanics' Tools, Electric, Chemical and Mathematical Apparatus, Wood and Lumber Machines, Hydraulics, Pumps, Water Wheels, etc.

HOUSEHOLD AND FARM IMPLEMENTS,

this latter department being very full and of great value to Farmers and Gardeners; articles embracing every department of Popular Science, which everybody can understand.

PATENT LAW DECISIONS AND DISCUSSIONS

will, as heretofore, form a prominent feature. Owing to the very large experience of the publishers, Messrs. MUNN & CO., as SOLICITORS OF PATENTS, this department of the paper will possess great interest to PATENTEES AND INVENTORS.

The Publishers feel warranted in saying that no other journal now published contains an equal amount of useful information, while it is their aim to present all subjects in the most popular and attractive manner.

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